SPIRIT IN MATTER

A Scientist's Answer to the Bishop's Queries

L. KOUSSO

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With 76 Illustrations, including 3 plates in Colour
and 8 Diagrams in Text.

L. KOLISKO

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PREFACE

Though a difficult subject, it is proposed in this publication to demonstrate that matter is not an inert mass of atoms, but is capable of expressing qualities far beyond the realm into which we ordinarily confine it.

The reader should bear in mind, that the content of this book is derived from years of patient and careful scientific research work. It is not a hasty or sensational theory, but an intimate and conscientious study of matter. Many of the experiments described were carried out as long ago as 1927. Some have already been published, but they were then considered from a different point of view. Primarily they were made with the aim of studying planetary influences, and were published under the title : " Das Silber und der Mond," 1929 (Silver and the Moon. Experimental Studies of the Biological Institute at the Goetheanum, Stuttgart).* After 21 years of continuous study an attempt is now made to publish some of these experiments under the title " Spirit in Matter." Throughout this time I have had many requests that these facts should be published, but again and again I have deferred doing this.

The experiments published here are purely scientific experiments, carried out with all the care of a true scientist who has a full sense of responsibility towards mankind. The various experiments should be shown in their original colours and the hope of being able to achieve this one day, also made me hesitate to print. Now, having come to the conclusion, that it will probably always be beyond the modest means at my disposal, I have decided to publish even though it is in an inadequate manner.

Another reason has prompted me to write this book now : the publications of Dr. E. W. Barnes, the Bishop of Birmingham.†

It seems that the time is now ripe, for a new knowledge of matter to come. When Science begins to infiltrate into religious life, and when Science comes into contact with the Church in such a way, that it arouses opposition both inside and outside the Church, it seems time to publish some hitherto unknown facts about matter.

A recently published review of Dr. Barnes' book by H. Moynihan in a weekly paper says :—

> " Dr. Barnes has come a long way from the days of his Gorilla sermons, in his efforts to close the widening gap between Science and Religion. His theories would, in the words of the Bishop of Chelmsford, ' strike a blue pencil through all the New Testament miracles.' Neither the Virgin Birth, nor the Reincarnation and Resurrection can be accepted if one believes, with him, that ' nothing can happen contrary to observed sequences in the laws of nature.'
>
> " What remains ? That is the issue which faces the Church—and, indeed the whole Christian world. For the ripples of controversy which were started by Darwin's stone are now breaking upon the shore."

In H. Moynihan's article we read : " It was in 1929 that he (Dr. Barnes) announced : the time has come for a revolution in religious thought : and it is up to us parsons to erect the barricades."

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* L. Kolisko, " Gold and the Sun." Experiments conducted during the Total Eclipse, 1936, in Asia Minor. " Gold and the Sun." Experiments conducted during the Total Eclipse, 1947.

† E. W. Barnes, " Should such a Faith offend ? " Sermons and addresses, Hodder and Stoughton, 1928. " The Rise of Christianity," 1947.

I think that the time has come for a revolution in scientific thought: and it is up to us scientists to remove the barricades.

In 1929, the same year in which Dr. Barnes spoke the words just quoted, I published a book " Silver and the Moon " containing 150 photographs of experiments with silver nitrate in which the fact was established that in a solution of silver nitrate the influence of the Moon forces can be traced by means of capillary tests. The silver solution rises in filter paper and forms specific patterns, which vary according to the phases of the Moon. Since some of these experiments are used in the present publication I quote the concluding sentences of the Introduction to " Silver and the Moon," written at Easter 1929:

" Thus, contemplating the Moon, our way leads us on the one hand from the realm of the Gods, to the World of the Stars, and then gradually downwards to the planet Earth, the Realm of Matter. From the torch-bearing goddess Selene, who rides in her silver chariot above the clouds, from the 'most admirable heavenly body' who is kindly disposed towards men, we come to the old globe of inert, burnt out matter, which revolves lazily round the planet earth. On the other hand we come from the angels who taught men the mysteries of the metals, down to silver looked upon as condensed Moon substance on earth, Moon beams condensed as it were into silver; and then to Luna commonly called silver, in the time when alchemy flourished, and finally to silver = Ag, a chemical element."

" Thus mankind stepped down from the realm of spirit into the world of matter; and now the time has come when the way must again be found from the realm of matter back into the spiritual world. Mankind must again wander through the world of the stars to the realms of Spiritual Beings, if it wishes to find the way to its origin."

Since I said this in 1929, it will be understandable that I now venture to demonstrate that we can find Spirit in Matter. True Science will lead us to the acknowledgment of spiritual facts. The unison of Science, Art and Religion must come in the near future. Scientists must arise who are at the same time endowed in their souls with the qualities of an artist and a priest. **Science must again become a holy Art,** if an unholy natural science is not to lead mankind to destruction.

Years ago Rudolf Steiner said prophetically to scientists: " One day there wil be Scientists who can show how Matter is arranged according to the will of Christ, and to whom the laboratory table will mean what the altar means to the priest." Let us hope that these scientists will soon be born. Perhaps we can do something to prepare their way.

L. KOLISKO

Easter 1948.

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INTRODUCTION

Since it cannot be assumed that every reader of this book is familiar with the author's previous publications dealing with this subject, it is necessary to introduce briefly the method and character of the experiments used for this intimate study of matter. All we need is filter paper, glass dishes, (preferably round) about 4 ins. in diameter, and the substances we wish to study. These are dissolved in rainwater or distilled water in various concentrations. The filter paper is folded cylindrically and is held in position by a metal clip. Then it is inserted into the solution ; a glass dish about 4 ins. in diameter requires about 10 cc. of the solution. After this has been done it is possible to watch how the liquid rises into the filter paper. We may take a note of how quickly it rises in 5 minutes or in 10 minutes. We can observe the speed, varying according to the substance used. After some time the liquid stops rising and a characteristic border line is formed. It may be a straight line, or a wavy line ; this depends on the substance used for the experiment. Some substances rise higher, some less high. We may study how this process of rising is influenced by changes in the temperature, or by changes in the humidity of the surrounding atmosphere. We may even start our studies with water only, watching the differences in the rising height during day and night, we may watch for every hour over a long period and record the results obtained in a graph.

Interesting results are obtained if we go on for a month, or better still for a year, studying water in this way, and, if possible simultaneously, solutions of silver nitrate, iron sulphate, copper sulphate, or other salt solutions, making accompanying graphs of the temperature and humidity. If these studies are carried out carefully and conscientiously over one year, the result certainly is interesting. But what is **one** year ? A mere nothing. At the beginning it may be satisfactory to compare the results obtained one day with the results obtained the next day ; soon we feel it is necessary to compare one month with another month ; then one year with another year.

With this type of experiment we remain in the sphere of measure, number and weight. This is a sphere where we feel completely safe. We think we can control every detail perfectly.

But the various substances are not only rising in the filter paper, they form a definite pattern as well and with this phenomenon we will deal in this publication. We want to study the **Formative Forces** of various substances, for instance the formative forces of **silver nitrate,** or **iron sulphate,** or mixtures of silver nitrate and iron sulphate, etc. To begin with, we study the differences which occur in the formative forces owing to the fact that an experiment is carried out during day time or during the night.

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I

STUDY OF THE DIFFERENCES OF FORMATIVE FORCES DURING DAY OR NIGHT

with the help of

Silver nitrate (1%)

Iron sulphate (1%)

Equal quantities mixed of: 1% **Silver nitrate and** 1% **Iron sulphate.**

„ „ „ „ 1% **Silver nitrate,** 1% **Iron sulphate and** 1% **Lead nitrate.**

As described previously the filter paper is immersed in a 1% solution of Silver nitrate ; the latter is allowed to rise until it comes to a stop of its own accord. This does not necessarily mean that the whole amount of 10 cc. has been absorbed. It does not matter that the filter paper remains immersed in the solution. The rising height will remain unaltered, unless there occurs a sudden change in the temperature or humidity of the atmosphere. The experiment is carried out during day time, fully exposed to the influence of the sun. After the rising activity has come to an end, the filter paper begins to dry from the border line downwards, and slowly turns light brown, and, later, darker brown. The border forms a specific pattern, similar to the one depicted on Plate 1, Fig. 1.

To facilitate the study of these experiments all the pictures are printed on single sheets, which can easily be taken out of the folder at the back of the book and spread out on a table.

Fig. 1 is a typical example of Silver nitrate, forming its characteristic pattern during day time. Of course variations occur in the rising height, especially on a rainy day ; or in the colour, if the experiment is carried out in midsummer when the sun is shining down fiercely, speeding up the process of reduction.

The same experiment may be carried out during night. It is done in the same room, at the same spot. The only difference is, that instead of the Sun, eventually the Moon may shine on the filter paper into which the solution is rising. Or, in a dark night, not even the Moon gives light. As a rule, the liquid rises higher, the temperature being lower and the humidity increased, compared with conditions during day time. Since there is no light, or only very little, the silver is scarcely reduced at all. In the morning we find therefore a very pale brown pattern, which darkens with the increasing daylight.

The pattern formed during the night is definitely different from the one formed during the day. Plate 1, Fig. 2 is a typical example of an experiment with Silver nitrate carried out during the night. Comparing Fig. 1 with Fig. 2 it is obvious that the Silver nitrate has risen considerably higher, that the border line is less sharply formed. Soft waves run across horizontally, whereas the day experiment forms a broad band intersected by vertically pointed darker lines or fringes.

Experiments carried out during the day or during the night are fundamentally different, and we may try to explain this by the presence or absence of light, the difference in temperature and humidity. Light especially seems an important factor where silver

salts are concerned. In our publication of 1929 we gave examples of experiments carried out during the day in a dark room, but we regret that it is impossible to go into all these details here.

Let us turn our attention to another salt, where the influence of light does not play such an important part, and study the differences between an experiment carried out during the day or during the night. For instance it is possible to take Iron sulphate. The crystals of Iron sulphate are light green and dissolve readily in water. Again a 1% solution is used. The experiment carried out in bright daylight shows the liquid rising, coming to a natural limit, and the filter paper slowly turns ochre yellow. The border line is well formed, intersected by numerous vertically pointed lines, but much more subtly formed than those observed in the experiment with Silver nitrate. In time this pattern will come out even more sharply, the yellow will darken to a deeper ochre tone. No further changes occur and such an experiment can be kept for an indefinite period. The experiment with Silver nitrate can only be kept a short while, even in a cool and dark room ; the silver gets darker and darker and the characteristic forms will eventually vanish completely.

The experiment with Iron sulphate is repeated during the night and again it can be observed, that the solution rises higher than during the day time. The pattern formed is much softer, compared with the day experiment, although different from the waves formed by Silver nitrate. The colours are just the same as those produced during the day and have the same tendency to darken slightly in time. But they never darken beyond a rich ochre yellow. Fig. 3 and Fig. 4 on Plate 2 are typical examples for such experiments with Iron sulphate.

A further step leads us to attempt a mixture of Iron sulphate and silver nitrate, using again 1% solutions and equal quantities. A chemical reaction takes place between those two substances and a greyish deposit is formed. The liquid rises and after a few minutes a tiny black spot appears on the filter paper, and then another and another ; sometimes with great speed, sometimes slowly, these tiny black spots grow and form peculiarly shaped arrows. The strange thing is, that, looking at the finished experiment, one is inclined to think that these arrows have been formed from the top downwards, but the opposite thing has happened in reality. The dark point of the arrow appeared at first and slowly opened up, growing from the bottom towards the top. This peculiar arrow-like structure is characteristic for a mixture of Silver nitrate and Iron sulphate. Neither the silver nor the iron alone can produce it, only the two together. The dark, nearly black colour is of course due to the Silver nitrate but the form is born out of the interaction of the two metal salts. Plate 3, Fig. 5 is a typical example of an experiment carried out during daytime. The presence of Iron sulphate in the mixture has in a way speeded up the reduction of the silver salt. The light parts show the yellow colour due to the Iron sulphate.

The experiment is repeated during the night and Fig. 6 on Plate 3 gives a good impression of the difference in strength of the formative forces during the night. An overwhelming wealth of forms pours down, or rather rises up. The border line shows clearly here and there the characteristic vertical stripes of Silver nitrate ; on the other hand we notice as well the subtle intersections derived from the Iron activity, and the multitude of arrows which point to the interaction of these two substances.

The great importance of studying the behaviour of substances during day or during night must be emphasised. Chemical reactions are different in their violence if the substances react upon each other during daytime or during the night. A reflection of this process is visible in the different strengths of the formative forces displayed in these experiments.

As a further proof of the difference between a day and night experiment, another example is given with a mixture of Silver nitrate, Iron sulphate and Lead nitrate. Three substances are brought into play ; two of them nitrates and one a sulphate. Again the chemical reaction can be observed, the deposit is formed, after these three substances are mixed in 1% solutions and equal quantities. It must be mentioned, although we do not wish to press this point further here, that it makes a difference if the mixture is made so that the two nitrates are mixed first, and then the sulphate is added ; or Silver nitrate is added to Iron sulphate, the chemical reaction is allowed to pass, and then the Lead nitrate is added ; or Lead nitrate is added to Iron sulphate, the chemical reaction sets in and then we add Silver nitrate.

The mixture of these three metal salts produces again another type of pattern. Silver nitrate has its own pattern and so has Iron sulphate ; the question arises : What is the pattern of Lead nitrate ? It is not possible to make it visible. Lead nitrate forms milky white, opaque crystals, which also readily dissolve in water ; but the rising lead nitrate leaves no trace behind in the filter paper. Only a very faint line marks the border. No colour, no form appears. But if we mix this elusive substance with the two others which produce forms abundantly, lead changes the formation of Silver nitrate and Iron sulphate and thus reveals to us some of its own characteristic formative force. The experiment is carried out during daytime and if we study the result obtained on Plate 4, Fig. 7, we notice that the forms are again arrow like. In their initial stage they look similar to the silver-iron arrows, but if we study the fully grown individual forms, then we notice the fundamental difference due to the presence of Lead nitrate. The forms are plump compared with silver-iron formations. The outlines are less clear. The whole character is more coarse. If we try to borrow an expression from the geological sphere, we might say the formation looks like that of a rock which has undergone the process of weathering. Somehow a process of **ageing** is expressed. The forms become crinkled. I must apologize for using these expressions ; I know that I trespass over the limits allowed for a scientific description, but in proceeding with my study of matter, it will become clearer and clearer that purely scientific descriptions prove insufficient for various phenomena we encounter. An artistic view point will have to be introduced. Years ago when I tried to convey to an audience, with the help of lantern slides, the difference between an experiment of Silver nitrate mixed with Iron sulphate, with another experiment where the three substances, Silver nitrate, Iron sulphate and Lead nitrate were mixed, I used the following simile : Silver and Iron compared with silver-iron-lead, seems like a young, fresh face compared with an old, wrinkled face. I still find that this comparison is not inexpressive. The forms built with the help of Lead nitrate added to Silver nitrate and Iron sulphate add **weight** and something that gives an impression of **age.** But it is not a weight which we can measure on scales, it is the impression of weight on a different level from the one which is accessible to our ordinary means of weighing objects.

The experiment is repeated during the night, and the result is depicted on Plate 4, Fig. 8. The impression of weight is still stronger in this experiment. The single forms seem to fall down heavily, whereas the forms due to the interaction of Silver nitrate and Iron sulphate fly lightly, like a shower of meteorites.

Figs. 1—8 are a few examples selected from thousands of experiments carried out since 1920, to demonstrate that specific formative forces can be found in matter, and that these forces differ fundamentally if they are at work during day or during night. Of course it is possible to study the differences due to day and night on many more substances and with other means than filter paper tests. For instance the force of crystallisation varies enormously during day or night ; here much can be found in observing the single forms, the speed with which crystallisation starts, the amount of substance crystallised in a certain time and so on.

II

INTERRUPTED EXPERIMENTS WITH IRON SULPHATE

We go a step further again in our study of matter. Hitherto the experiments have been carried out either by day or by night. Now we proceed to combine the day experiment with the night experiment in the following manner. We use a solution of Iron sulphate and let it rise in filter paper during the day. The liquid stops rising, and the filter paper becomes dry, as described previously. The day experiment is finished.

After sunset, with the beginning of night, we start the process of rising again. Once more Iron sulphate is allowed to rise through the experiment formed during day, after several hours of interruption. The solution passes through the filter paper, reaches the border line formed during the day, passes it and rises higher until the second limit is reached in the early morning hours. Once more the filter paper dries. The second part of the experiment is finished.

The result is definitely startling. Again another pattern is formed by Iron sulphate. The pattern becomes clearer after some days, it " matures." The forms stand out very clearly, in a deeper ochre yellow than the rest of the filter paper. Quite impressive forms are visible. Plate 5, Figs. 9 and 10 are two examples again selected out of many thousands of experiments. The two examples depicted here can really stand as **symbolic** pictures for the formative force hidden in Iron sulphate. They look similar to fingers pointing downward, sometimes like a closed fist, with one pointing finger. A strange, but often noticeable phenomenon is a minute deposit of Iron salt at the end of the finger-like form, adding to the impression of a finger with a nail.

This type of picture is only obtainable if the experiment is carried out in the above-mentioned way, at first during the day and then restarted in the evening, and finished in the early morning hours. The forms vary according to the various days or months, in which the experiments are conducted ; still, the main characteristics remain the same.

When we try to understand this specific formative force of Iron sulphate revealed here, and then return to the results obtained with a mixture of Iron sulphate and Silver nitrate it is quite easy to understand how the arrow-like forms are built through the combined activity of silver and iron.

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III

INTERRUPTED EXPERIMENTS WITH SILVER NITRATE

The same experiment is carried out with Silver nitrate. 1% Silver nitrate rises into the filter paper during day ; reaches the natural limit after several hours, begins to dry and develops its characteristic coloration. The experiment comes to a standstill and is restarted in the evening. Plate 6, Figs. 11 and 12 are two experiments obtained in the month of March, 1927. The limit of the day experiment is recognizable in about the middle of the picture. The border line drawn during the night reminds us slightly of the wavy forms of Fig. 2, Plate 1 ; however they are different, less soft, more determined in form. The space between the line marking the end of the day experiment and the other one, marking the end of the night experiment is filled with radiating lines of manifold structure. Here again we see that a third type of pattern is formed, which differs from a simple day or simple night experiment.

Day and night interwoven, form a more complicated pattern.

Silver nitrate is a substance which offers us many possibilities of entering into an intimate study of matter, but only if we persevere ceaselessly for many years.

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IV

INTERRUPTED EXPERIMENTS WITH SILVER NITRATE FOLLOWING THE COURSE OF ONE YEAR (1927-1928)

Plate 7, Fig. 13, shows another experiment carried out in the month of March, 1927. The day and night part of the experiment can easily be discriminated. We find in the lower half of the picture three distinctly marked lines. The explanation is very simple. It was a rather hot spring day, with bright sunshine falling directly upon the filter paper and after a relatively short time the first border line formed, the rising process stopped. Clouds passed over the sun for a short while, but it was sufficient to make the Silver nitrate rise again and stop after a few minutes. Once more the sun was over-clouded, and again the solution started to rise, coming then to the ultimate stop for the day, with a dark brown band, without the formation of the vertical lines. During the night the silver formed delicately fan-like forms, intersected by many radiating lines. The colour was a warm soft brown in the early morning hours. The big white spot in the middle was disappointing ; it seemed to spoil the otherwise harmoniously formed and coloured experiment. It was also not easy to explain why just one particular spot was free of radiating lines and the silver not reduced. The filter paper was carefully examined for defects ; but the texture was perfect, the white spot had been penetrated with the solution as thoroughly as the rest of the filter paper and yet it was void of form and colour. We made these experiments each day and photographed each experiment immediately after its completion, to keep a perfect record over a long time. Afterwards the originals were kept in a dark room, wrapped in black paper, to preserve them as long as possible. After some time we looked again and found completely unknown pictures. Fig. 14 on Plate 7 is the same experiment as Fig. 13, but photographed a few days later. What has happened to the experiment ? The beautiful, delicate structure of the feathery, fan-like pattern has disappeared. The colours have become darker, and powerful forms have developed. An incredible change has occurred. Where at first the disappointing white spot seemingly spoiled the result obtained, something new is now visible. A slow developing process has taken place in the dark room, similar to the developing process with which we are familiar in photography. But—where is the object we have photographed ?

Many questions stand before our searching minds. So we go on day after day' month after month, and then year after year. We ask the substance of silver to reveal its secrets to us.

Each day another form appears. All we can do is to place these forms before us, and try to understand their language. For this publication it is necessary to limit myself to two typical examples for each month ; in this manner it will be possible to place a fair average for a whole year before the eyes of the reader.

Plate 8, Figs. 15 and 16 are two of the experiments made in the month of April, 1927. In Fig. 16 the photograph has been taken after the forms had fully matured, in Fig. 15 the photo was taken at an earlier stage ; thus, we still can see the subtle radiating structure, although the forms which will appear later are already faintly indicated. Compared with the previous month, it seems as if the forms are more powerful.

Plate 9, Figs. 17 and 18 are examples for the month of May, 1927. A further enormous increase in the power of forming is distinctly noticeable.

Plate 10, Figs. 19 and 20 are two examples for the month of June, 1927.

Plate 11, Figs. 21 and 22 are two examples for the month of July, 1927.

Plate 12, Figs. 23 and 24 are two examples for the month of August, 1927.

For the month of September, we chose only one typical example, but decided to show various stages in the process of developing. Plate 13, Fig. 25 shows the experiment immediately after it was finished. There is a great difference in the coloration between the lower and upper part. The strong colours indicate, that it was a beautiful sunny day. The sun has inscribed manifold lines radiating through the part formed during the day.

The night part is scarcely visible. We can barely discriminate the border line, and from there, stream downward various lines which look as if they were engraved with a hard pencil. The colour was extremely light brown.

Plate 13, Fig. 26 shows the same experiment photographed a few days later. It is obvious that the lower part has undergone a further darkening, as well as the upper part. We see beautifully engraved graceful lines, and the often observed fan-like feathery structure. A closer observation will reveal an indication of the form which will develop still later.

Plate 14, Fig. 27 shows the same experiment, photographed again some time later. It seems as if the lower part has cleared, and the upper part has darkened considerably. The forms develop further and the middle part, which will later on show the final picture, stands out much more clearly already than in the previous photograph.

Plate 14, Fig. 28 is the same experiment photographed when the middle part was fully developed. At the same time we observe the withdrawal of some of the finer structures still visible on the earlier photographs.

Plate 15, Figs. 29 and 30 are two typical examples for the month of October, 1927. The richness of the formative forces decrease, in comparison with those of the previous months.

Plate 16, Figs. 31 and 32 are two typical examples for the month of November, 1927 and show this phenomenon to an even greater extent. The border line traced by Silver nitrate during the day is very clear and impressive, but especially in Fig. 32 the part due to the night is void of characteristic forms. Instead a broad horizontal, black zone appears. The top line reminds us very much of the wavy, simple lines drawn by a night experiment carried out separately, not in connection with the experiment carried out during daytime. (Compare Plate 1, Fig. 2).

Plate 17, Figs. 33 and 34 show the same phenomenon for the month of December, 1927. During the day there was sufficient activity of the sun to form a strong, characteristic day experiment, but during the night the specific forming process is lacking.

Plate 18, Figs. 35 and 36, two typical examples for the month of January, 1928, are definitely a further step in the withdrawal of the formative force. Fig. 36 looks completely empty as far as forms are concerned.

Plate 19, Figs. 37 and 38 two examples for the month of February, 1928. Fig. 37 reminds us of the experiment, Plate 17, Fig. 33 (December 1927), whereas Fig. 38 brings us back to the soft radiating forms of the spring months of 1927.

Plate 20, Figs. 39 and 40 are examples for the month of March, 1928, and return again to the display of soft, radiating lines with feathery structures and the formation of specific forms in the upper part of the pictures, due to the intermingling of the day and night experiment.

Plate 21, Figs. 41 and 42 are two examples for the month of April, 1928, and we find a rich display of formative forces unfolding. The originals had a warm brown colour in various shades.

We suggest that the reader places all the plates, numbering from 1, then 5—21 on a table, and studies carefully the changes visible in these experiments with Silver nitrate between March, 1927 and April, 1928. Then it will be obvious that from March onward the formative forces seem to increase, become richer and richer, reach a certain climax, then decrease and disappear completely between December and February. They appear again in the month of March and definitely have the tendency to increase further in the month of April, 1928. This is a phenomenon well known to us, if we watch in nature, the vegetation coming to a new life again in Spring, developing more and more strongly during the following months, reaching their climax of growing, then blossoming, bearing beautiful flowers and then fruits towards autumn, withdrawing slowly, and finally leaving the trees bare of leaves when the land is covered with a blanket of snow. Is this process not reflected in the behaviour of silver nitrate ? We may look at these pictures from a purely scientific standpoint and try to describe them objectively, giving figures for the rising height, and so on, but would such a description do full justice to the phenomenon clearly visible to our wondering eyes ? Spring and Summer, Autumn and Winter are expressed in an experiment with a seemingly inert, dead substance if only we open our eyes to see this. **Matter** seems to come alive and talks to us in a wonderful language. We cannot fully understand or interpret these phenomena from the pedestal of a scientist, we must look at them with the loving eye of an artist, to be able to grasp at least something from the " open secret " (offenbares Geheimnis) to use an expression of Johann Wolfgang Goethe.

What Goethe discovered, as the law of Metamorphosis in the plant kingdom, becomes equally visible in the realm of matter. But it needs the loving eye and open mind of an artistic soul, which still can contemplate with the utmost objectivity the changes in the realm of forms and colour. The Scientist must become an Artist in his soul, to interpret rightly the result of these experiments.

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V

EXCEPTIONAL EXPERIMENTS WHICH MAY BE OBSERVED DURING THE COURSE OF A YEAR

A few examples have been given in the previous chapters to demonstrate a new way of studying matter. For each month only two experiments have been carefully selected, to give a fair average for the month. It has been mentioned already that the experiments have been carried out every day with many substances, and for a long time we took photographic records for every day. This enabled us to spread out before us and study 365 pictures of Silver nitrate for a whole year. This is not an easy task. It is overwhelming to glide over so many forms with one's eyes to compare them and arrange them in their proper order. They seem to come alive and to move, they mingle into each other, they metamorphose into one another. The realm of form is powerful. In this intimate study of Silver nitrate, a few pictures stand out as " **unique.**" They do not fit in with the rest.

Plate 22, Fig. 43 is one of these pictures : **Easter Sunday,** 1927. Looking at this picture, it seems as if we behold the form of a flower, perhaps the opening bud of a tulip ; but it is not yet at the surface of the soil, it is still beneath, trying to push its way through to the sun. We know that this description is unusual, to say the least, from a scientific standpoint. But we are sure that those who have eyes to see, will understand that we are giving a true description of the strange phenomenon.

We emphasize once more : these are objective, scientific experiments. There is nothing mysterious about them. Everybody can try to repeat them. Success will entirely depend on the care and selfless devotion exercised.

Another picture which stands out in the course of the year 1927, is depicted on Plate 23, Fig. 44 : **" St. John's Festival,"** the 24th June, 1927. Here we observe the formation of " stars." There are two large stars in the lower part of the picture, where specific forms never arise ; two smaller stars, connected with the larger ones, are formed in the upper part of the picture, between the border line separating the day from the night experiment.

The question is often asked : are these experiments repeatable ? Has it been possible to get an identical picture on another Easter Sunday, or at another St. John's Festival ? It is a rule in science to accept only when experiments can be repeated over and over again with the same result. This strict rule holds good for most phenomena—but—it cannot be applied to everything. There are things " that *can* happen contrary to observed sequences in the laws of nature." (See quotation in the Preface, page iii). There are phenomena, which are " unique," which cannot be repeated, and yet are true.

The Easter Sunday of the year 1920 is not identical with Easter Sunday, 1921 or 1922. It cannot be identical and it would be nonsense to expect this. Year after year we watched carefully the results obtained, and have come to the conviction, that substances do respond in a unique way at certain times of the year.

Plate 24, Fig. 45 is the result obtained on **Easter Sunday, 1928.** We believe that every objective scientist will agree, that this experiment comes very close to the one obtained on **Easter Sunday, 1927.** It is not identical, but very similar. Perhaps it could be described thus: the same mood is expressed in 1928 in Silver nitrate as it was in 1927. Strange as it may sound, it seems permissible to speak of a **mood** expressed in Matter.

Again the reader is asked to place before him the three pictures represented on Plates 21, 22 and 23: Easter Sunday, 1927—St. John's Festival, 1927—Easter Sunday, 1928. Threefold can our response be: **scientific, artistic** and **religious.** The Scientist in us is roused, but also the Artist, and, deep down in our soul, religious feeling stirs.

The Spirit of Easter finds expression in Matter.

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VI

THE GREAT FESTIVALS OF THE YEAR AND THEIR REFLECTION IN SCIENTIFIC EXPERIMENTS

THE EASTER FESTIVAL

It must be stated, that all the experiments carried out so far, had not been undertaken with the purpose of finding these strange phenomena. They were undertaken solely to study objectively the various changes happening in the formative forces: (*a*) during day or night, (*b*) during the course of a year. The result obtained was unsought for and unexpected. But since then, of course special attention has been paid to **Easter, St. John's Festival** (Mid-summer), **Michaelmas** (September or Autumn Festival) **Christmas** (the 13 holy nights) representing four great festivals connected with the Spring Equinox, Summer Solstice, Autumn Equinox and Winter Solstice. Incredible as it may seem, experiments carried out during these times show changes which lift them out from the ordinary course of the year. Year after year, something happens in nature which is reflected in various substances like Silver nitrate, Gold chloride and others, which cannot be explained scientifically with changes of temperature, or humidity in the atmosphere, or differences of light. Once more we emphasize, that before we are justified in making such a statement, it is necessary to make all the experiments with all the various substances and their combinations, every day and every night, for many years without interruption. The work has to be done by the same person at Easter and Christmas, at Midsummer and Michaelmas, day and night. One must dedicate oneself completely to this task. It is also obvious that these experiments can only be carried out in an attitude of devotion and reverence towards the great cosmic laws.

The Easter Festival

The Easter Festival is a movable festival, in fact the only movable festival; the first Sunday after the Full Moon which occurs after the Spring Equinox. We still look towards the stars when Easter Sunday is fixed. From time to time attempts are made to break with this old tradition and to " reform " the calendar, in order to adapt it to our present day needs. It is inconvenient from a business standpoint to have to deal with a movable Easter Festival. The question arises: What is the background of such an old tradition? How far can we trace it? Is modern man justified in keeping these traditions, or ought he to dismiss them altogether and arrange his calendar more conveniently?

In the Easter Festival we commemorate the death and resurrection of Christ. But can we trace historically the date of the Last Supper? The Bishop of Birmingham studied this possibility and we find it expounded in his recent book: " The Rise of Christianity " on page 150 under the headline: " The Last Supper." It seems that nothing but uncertainties are the outcome of such historical researches. Dr. Barnes states, that it is a curious fact (page 74) that we have no certain knowledge either of the year in which Jesus was born, or of the year when he died. The data by which the two years must be determined are scanty and confused. On page 153 the Bishop of

Birmingham comes to the conclusion: " What matters in our inquiry is, that from it we realize that we can have little certainty as to the circumstances surrounding the death of Jesus. Early Christians supplemented their ignorance by allowing religious imagination to clothe the bare stark fact of the death of their Lord. Such a suggestion is repugnant to many, but, if the crucifixion story as it stands is drama and not history, it is, at least, drama shaped by the great art that can result from love, reverence and tears. According to the synoptic tradition, the fifteenth day of Nisan, in the year of the crucifixion of Jesus, fell on a Friday. It might be thought that this fact—if it be a fact—would furnish a clue to the year in which his crucifixion took place. Experts, however, seem to be agreed that there are too many uncertainties connected with the Jewish calendar to allow of satisfying argument. The Quartodeciman Easter, as we have said coincided with the Jewish Passover. The synoptic Easter, on the other hand, commemorated the Resurrection which took place, according both to the synoptic story and to the Johannine, on the Sunday following the Friday of the Crucifixion. Sunday rapidly became the Lord's Day ; and the great Sunday of the year was Easter Day."

This is what a representative of the Church finds in his historical enquiries: nothing but uncertainties. The methods of historical research do not yield more, apparently.

Rudolf Steiner, the inaugurator of the Anthroposophical Movement, gave many lectures during his life about the great festivals of the year, especially the Easter Festival. Some of these lectures have been translated into English and can be studied by anybody who wishes to do so. I suggest " Easter as a chapter of the Mystery Wisdom of Man " 1924, or: " Four Seasons and the Archangels' 1923," but above all I wish I could quote extensively from the lectures given by Rudolf Steiner in Dornach (Switzerland) between the 31st March and 7th April, 1923. The title of these lectures, which are not translated to my knowledge, is: Der Jahreskreislauf als Atmungsvorgang der Erde. Die vier grossen Festeszeiten des Jahres. Wie wird aus Natur-Erkenntnis Geist-Erkenntnis." (The course of the year—a breathing process of Earth. The four great Festivals of the Year. How can the knowledge of Nature become a knowledge of Spirit ?)

Here we find a true knowledge which helps man to understand the great festivals as spiritual, cosmic facts.

The year 1943 presented us with a very interesting problem. The Astronomer Royal and the Church held different opinions concerning the date of Easter Sunday. According to the Astronomer Royal the first Sunday after Full Moon after the Spring Equinox fell on March 28th.* That means Easter should have been early in 1943. The Church Tradition ruled, that the Full Moon which had to be considered as the Easter Moon fell a month later and therefore Easter Sunday was fixed by the Church authorities to be on April 25th, 1943.

Only one of these could be right. But who could decide whether it was the Astronomer Royal or the Church authorities ? It seemed a good opportunity to test our method. Were the substances able to decide when Easter Sunday was celebrated in Nature, in the whole Cosmos ? It is obvious that we cannot reproduce here all the experiments made during the time in question. All we can do is to select a series of experiments carried out with seven representative metal salts: Silver nitrate, Quicksilver chloride, Copper sulphate, Gold chloride, Iron sulphate, Tin-chloride and Lead nitrate

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* Spring Equinox, 21st March, at 0h. 3m. p.m.
Full Moon, 21st March, 10h. 8m. p.m.

at Noon during the Spring Equinox, at Noon on the 28th of March (Easter Sunday according to the Astronomer Royal) and at Noon on April 25th (Easter Sunday according to the Church tradition). The photographic reproductions have been arranged on the various plates in such a way, that it is easy for the reader to place them on the table in the right order underneath each other, so that the eye can travel either in a horizontal direction to observe the differences expressed in the various substances used at the identical time, under the same conditions of temperature, humidity of the atmosphere and light. Or the eye can travel in a vertical direction and compare the experiments of the same substance in their variation according to the various dates. At first the description will be given following the horizontal arrangement.

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DESCRIPTION OF THE EXPERIMENTS WITH VARIOUS SUBSTANCES CARRIED OUT AT NOON THE DAY OF THE SPRING EQUINOX

Plate 25, Fig. 46, 1% Gold chloride and 1% Silver nitrate, equal quantities: the result is a pleasing picture, clear in colour, not specially rich in forms. The border line, describing a wide curve, is intersected with tiny waves of purple-mauve. Underneath spreads a broad light yellow band. Most of the gold activity is visible in the more richly coloured lower part.

Plate 26, Fig. 48, 1% Gold Chloride and 1% Quicksilver chloride, equal quantities mixed: the original was beautifully coloured, in various shades of mauve, mostly deep purple. A strongly marked dark line runs across horizontally, forming big waves. On the crest of these waves a light mauve band is outlined. Immediately below the border line is a band of various shades in light purple. The border line describes a less wide curve than the experiment with Gold chloride and Silver nitrate; on the other hand the entire picture has been coloured through the activity of Gold chloride. We would call this, too, a pleasing result, but without any outstanding qualities.

Plate 27, Fig. 50, 1% Gold chloride and 1% Copper sulphate, equal quantities mixed: The colours of the original were clear, purple-mauve. As in the experiment with Silver nitrate, we notice at the top a broad band into which the gold colours have not penetrated. It is slightly yellow. The border line itself describes an even wider curve than in the previous experiments mentioned; its colour is pale green, indicating Copper sulphate. This experiment we would describe as uninspiring.

Plate No. 28, Fig. 52, 1% Gold chloride: This is a very beautiful picture, from the form principle as well as from the standpoint of the colours displayed. It is really and truly a beautiful Spring experiment. We also observe that the colours have been carried right up to the top.

Plate 29, Fig. 54, 1% Gold chloride and 1% Iron sulphate, equal quantities mixed: There is nothing uncommon in this result. The colours are clear light pink, the forms unspecific. The broad band on top is mostly due to the yellow of Iron sulphate. The border line is light yellow and only slightly curved.

Plate 30, Fig. 56, 1% Gold chloride and 1% Tin chloride, equal quantities mixed: here again we would say, it is a beautiful Spring picture with clear, bright colours and forms. But the forms are not so much due to the presence of tin in the mixture, as to

"the character of the day,"* imposed by the gold influence, or we would say due to the position of the Sun, since it is the Spring Equinox. We ask the reader to compare this picture carefully with Fig. 52, Gold chloride alone. It is the gold which rules in this picture over the tin. We observe a broad light band on top and the border line is only faintly inscribed, with tiny mauve waves. The curve is strong as in Fig. 46 and 50.

Plate 31, Fig. 59, 1% Gold chloride and 1% Lead nitrate, equal quantities mixed : This experiment we also judge as being a very beautiful Spring experiment, as far as form and colour are concerned. We must repeat here what we have just said about gold-tin. The " character of the day " comes in strongly and overpowers to a certain extent the specific qualities of the various metal salts. The deepest shades are of reddish purple, radiating through the whole lower part, then follows a more delicate pinkish purple and a broad light yellow zone. The border line is finely drawn in purple. We recognize the great part which is played by the gold in the forming. A similarity is apparent between this experiment and the one with Tin chloride, a likeness which is emphasized through the black and white reproduction, where the forms stand out much more clearly and the distinctive differences given by the various colours cannot come into their own. The originals are more different than the black and white print makes them appear.

As our eyes glide along the complete series of seven pictures, we notice that although each experiment represents another metal salt combined with gold, something weaves through the whole series which makes them belong to each other. A certain way in which the forms lift themselves up and are rounded off like a cupola is inherent in each of them, and gives—as I expressed before—the character of the day. It would be impossible to replace one picture of this series with an identical experiment carried out the day before, or the day after : it would be obvious as not belonging to this series.

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DESCRIPTION OF THE EXPERIMENTS CARRIED OUT WITH VARIOUS SUBSTANCES AT NOON 28th MARCH, 1943, THE DAY FIXED BY THE ASTRONOMER ROYAL AS EASTER SUNDAY

Plate 25, Fig. 47, 1% Gold chloride and 1% Silver nitrate, equal quantities mixed : Even the black and white print can suggest how beautiful this picture was in its original colours. Beginning the description from the bottom we find a dark purple arc in the centre below, interrupted by a small band of pinkish purple, the rest of the picture has interweaving shades of light and dark purple. On top we notice to both sides light half circles ; these were golden yellow in the original. Here and there light blue appears. The whole space from top to bottom is filled with weaving, streaming colours. The centre top is formed by a narrow golden band in continuation of the two half circles mentioned before. The border line itself is of delicate light mauve. It is not possible to describe such pictures adequately. Certainly the description calls for an artist more than a scientist. This is a result which is not obtained ordinarily and we have to set this picture apart.

* We must take into consideration that two phenomena are reflected in these experiments : the Spring Equinox and the Full Moon.

Plate 26, Fig. 49, 1% Gold chloride and 1% Quicksilver chloride equal quantities mixed: Again the result shows unusual beauty in colour and form. The dark shades in the middle are bluish purple, of slightly metallic lustre. A narrow light band weaves near the top, having the light mauve shade of lavender. The centre is topped with golden yellow and both sides are dark mauve, similar to the experiment with silver and gold. The golden yellow did not occur in any single experiment of the previous series carried out during the Spring Equinox. This experiment we must also classify as unusually beautiful and impressive.

Plate 27, Fig. 51, 1% Gold chloride and 1% Copper sulphate, equal quantities mixed: We need hardly say that this is a " unique " picture for Gold chloride and Copper sulphate. Again and again we return to this picture, admiring its beauty. We see in the lower part a dark purple arc, intersected with lighter bands, similar to the form in Fig. 47 (Gold chloride and Silver nitrate). The arc is crowned by a wavy band of pinkish purple and above it a strange form appears that splits, as it were, into two halves ; shaded in light and dark purple. This picture seems a metamorphosis of the two previous experiments. The dark arc is as in Fig. 47, the elongated form as in Fig. 49, but split into two ; it is a metamorphosis from silver to quicksilver to copper formative forces. An artist's eye will enjoy this play of formative forces. (To make our description more clear, a few diagrammatic sketches follow, covering the phenomenon of metamorphosis for the complete series). On top of the central form is a narrow band of golden yellow, surrounded by a purple line. The border line is formed by a green copper zone. Never, in all the years of experimenting with gold and copper, has a similar picture been formed. It stands there unique in its beauty of colour and strangeness of form.

Plate 28, Fig. 53, 1% Gold chloride: In the middle below we notice again the dark purple arc, perhaps widened horizontally, intersected with many rhythmically arranged wavy lines in various shades of purple. These waves are repeated faintly, above the darker middle part, and change into pinkish purple for the rest of the picture. The central arc has dark purple waves on both sides, which complete the middle structure of the form (see diagram). The light waves on top look identical with those in Fig. 47 and have that same golden yellow. Here and there are light blue shades and again golden yellow in the centre top ; both sides are encircled by a dark purple line. Here too the colour was overwhelmingly beautiful. These pictures seem to come alive. Their beauty is somehow different in character from the other results.

Plate 29, Fig. 55, 1% Gold chloride and 1% Iron sulphate, equal quantities mixed: This picture is vividly coloured. In the lower part we notice various delicately formed wavy lines in rhythmical arrangement. The colours, due to the activity of gold, are carried right up to the top and only a narrow band bears witness to the presence of Iron sulphate. Still, we would not classify this experiment as of outstanding value.

Plate 30, Fig. 57, 1% Gold chloride and 1% Tin chloride, equal quantities mixed: This is a very beautiful result. The form, which we pointed out especially in the previous experiments, as a dark purple arc in the centre below, is also indicated in this experiment, but is more delicately shaped and much lighter in colour. The central figure which reminds us of the formation in Fig. 49, (Gold chloride and Quicksilver chloride) is continuously interrupted by lighter and darker shades of mauve arcs. In the quicksilver experiment, the top of the elongated form has been described as golden yellow, and here too it is of golden yellow, but much more widely formed. A strong line of dark purple rounds off the more vividly coloured part of the experiment and is then followed by a light yellow zone with a faint mauve border line.

Plate 31, Fig. 59, 1% Gold chloride and 1% Lead nitrate, equal quantities mixed: Here too we have the immediate impression that we are faced with an unusual picture. The dark arc described in Fig. 47 (Gold chloride and Silver nitrate) has loosened up. It is there, but metamorphosed. The form which is half hidden in Quicksilver—Gold chloride and is worked out more definitely in Tin chloride—Gold chloride, comes to perfection in Gold chloride—Lead nitrate. The middle structure is outlined by a distinct red-purple line. Dark wave interchanges with light wave in rhythmical sequence, encircling on top two light pinkish-yellow spots which look like eyes and give the picture a mask-like character. The colours have reached to the top, where a wavy line changing between yellow and purple colours form the border. This too, is a " unique " picture for Gold chloride and Lead nitrate. We have never had a similar one, and cannot expect to find it repeated.

These seven experiments again form a unit, they belong together in a mysterious way. The metamorphosis of the middle form is indicated in the following diagrams.

FIG. 1

Gold chloride and Silver nitrate

FIG. 2

Gold chloride and Quicksilver chloride

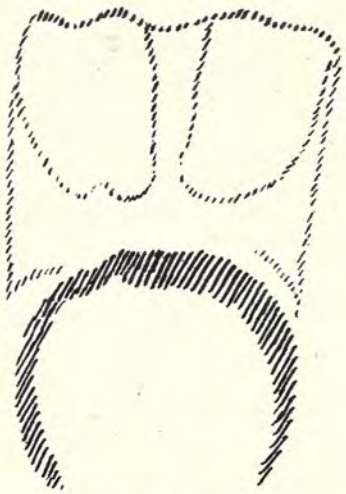

FIG. 3

Gold chloride and Copper sulphate

FIG. 4

Gold chloride

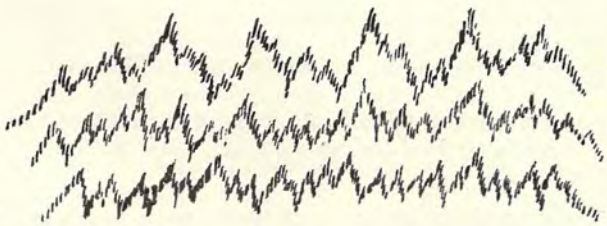

FIG. 5

Gold chloride and Iron sulphate

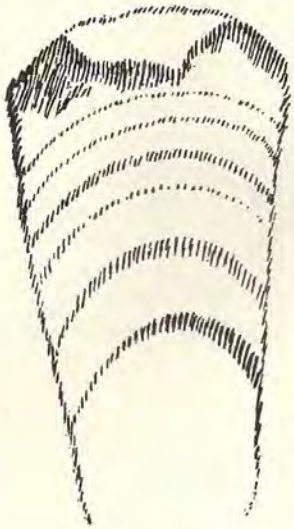

FIG. 6

Gold chloride and Tin chloride

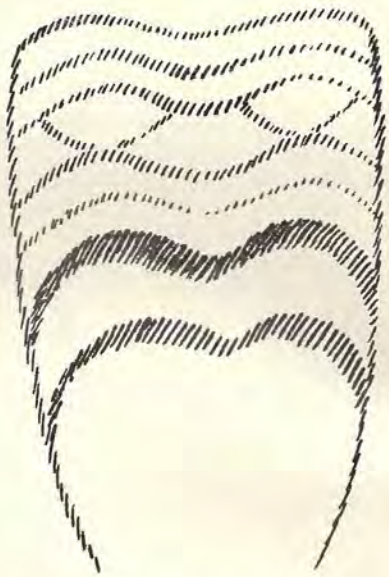

FIG. 7

Gold chloride and Lead nitrate

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DESCRIPTION OF THE EXPERIMENTS WITH VARIOUS SUBSTANCES CARRIED OUT AT NOON ON APRIL 25th (EASTER SUNDAY ACCORDING TO THE CHURCH)

Plate 32, Fig. 60, 1% Gold chloride and 1% Silver nitrate, equal quantities mixed: This experiment does not look specially beautiful; there is no characteristic form (unless we take the dark shape in the centre lower part, as a kind of inverted arc) compared with the experiment of Silver nitrate and Gold chloride in the previous series. A fine wavy line indicates the end of this form. The colours in themselves are quite beautiful, light and dark mauve; there is even a slight indication of yellow on the top. But the colours run into each other and form a chaotic mixture; they are blurred and show a tendency to deteriorate quickly. We certainly would not call this a specially beautiful result.

Plate 33, Fig. 62, 1% Gold chloride and 1% Quicksilver chloride, equal quantities mixed: As far as the colours are concerned, the original looked clear and beautiful, but no forms whatsoever are noticeable. The border line is unquiet, partly formed of tiny waves, partly of stronger, intersected waves; however it is a clear, dark purple line. All we could say of this result is that nothing unusual has happened.

Plate 34, Fig. 64, 1% Gold chloride and 1% Copper sulphate, equal quantities mixed: This we would term a specially insignificant, expressionless picture of gold chloride and copper sulphate, which is seldom obtained. Even the colours do not look very bright. Most of the picture is dark purple, contrasting with the top band of light bluish purple, followed by a band of light yellow and a scarcely noticeable border line of pale green. This is a disappointing result.

Plate 35, Fig. 66, 1% Gold chloride: The original was vividly coloured, but rather dark in appearance. The gold activity has reached to the top and formed a clear dark mauve border, intersected with tiny waves. Underneath the dark border, we notice a narrow band of light purple, and near the middle of the picture traces of golden yellow. Then follows again an irregular dark band which lightens up towards the centre and is followed by a wavy line of bluish purple.

Also here we could only say as a general description that the result is dull.

Plate 36, Fig. 68, 1% Gold chloride and 1% Iron sulphate, equal quantities mixed: A close observation will reveal that this is a very delicately formed picture. The colours are the usual pinkish purple, but the background of Iron sulphate prevails. The borderline is yellow and is characteristic for Iron sulphate alone. The lower part, especially the centre, has a subtle, intricate pattern of rhythmically distributed waves. They give to this picture a certain character and beauty. But it is not of outstanding value.

Plate 37, Fig. 70, 1% Gold chloride and 1% Tin chloride, equal quantities mixed: There is a completely horizontal distribution of the pattern in this experiment, but a few radiating lines in the vertical direction are interwoven. The colours are not so pleasing, because the purple turned brownish-yellow. This picture is difficult to describe; an underground of yellow gives the whole a certain warmth, but mars the purity. This result is not of special value, neither in respect of colour, nor of form tendency. Tin chloride and Gold chloride are usually more beautiful.

Plate 38, Fig. 72, 1% Gold chloride and 1% Lead nitrate, equal quantities mixed: This is the best picture in the whole series. The colours are beautiful and also the forms show some of the characteristic qualities. We consider this a really expressive, beautiful Spring picture of Gold chloride and Lead nitrate. Therefore we selected this experiment for our recent publication "Gold and the Sun" (Experiments conducted during the Total Eclipse, 1947) to demonstrate a typical Spring experiment in contradistinction to a typical Mid-Winter experiment.

This series of seven pictures cannot be described as forming an obvious unit, as the other two series do. Here we could easily remove one or another picture and replace it by an experiment of the day before or the day after, without producing a disturbance, with the sole exception of Fig. 72. This is a beautiful Spring type and is not so easily replaced.

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OBJECTIVE COMPARISON OF THE THREE SERIES OF EXPERIMENTS

When we start to compare the three series of experiments described above, we must be clear from what point of view we undertake this comparison. From the standpoint of the scientist alone, it would be rather difficult to find a basis for judgment. We have to deal with form and colour and something even beyond form and colour, expressed in what we might call "the mood" weaving through the pictures. We have to look at them from an artistic point of view as well. The scientist is called to judge

definitely, but he has to look with the eye of an artist. It would not do to look at a work of art like a Madonna of Raphael, and to appreciate only how the blue and red and green are arranged here and there in space, and forget the lovely expression on the face of the Madonna. It would be just as foolish to look at the experiment obtained by the use of Gold chloride and Copper sulphate on March 28th and only stare at the distribution of purple and yellow and green in the filter paper and overlook the total expression presented in the picture. Of course it will depend on the observer : can he see it, or can he not ? Here **our** possibilities come to an end. But the same thing applies to every work of art. Can the observer see anything in it beyond a splash of colour or not ?

What we see in the above experiments, is certainly penetrated by beauty ; they are pictures painted by nature. The scientist only offers the opportunity for nature to paint, by choosing the right substances and the right time.

We now make a choice from the three series of experiments according to our principles explained previously.

Plate 25, Figs. 46 and 47 and Plate 32, Fig. 60, three experiments with the same substances, Gold chloride and Silver nitrate mixed in equal quantities. Without doubt we select Fig. 47 on Plate 24. The other two experiments are less expressive in their whole character and coloration.

Plate 26, Figs. 48 and 49, and Plate 33, Fig. 62, three experiments with the same substances, Gold chloride and Quicksilver chloride mixed in equal quantities. It is again easy to choose as the most beautiful and impressive Fig. 49 on Plate 26. The other two experiments do not reach the same standard.

Plate 27, Figs. 50 and 51, and Plate 34, Fig. 64, three experiments with the same substances, Gold chloride and Copper sulphate, equal quantities mixed : The choice is equally easy and falls on Fig. 51, Plate 27. As we have mentioned already, it is a " unique " picture. The other two experiments are neither outstanding in colour nor in specific forms.

Plate 28, Figs. 52 and 53, and Plate 35, Fig. 66, three experiments with the same substance, gold chloride : Here, perhaps, we might hesitate between Fig. 52 and Fig. 53. After careful consideration, we still come to the conclusion, that the most impressive result is obtained in Fig. 53, Plate 28. Here the final judgment can only be arrived at by studying the original, or, if the experiments could have been reproduced in colour. Although Fig. 52 is very beautiful and displays all the qualities a beautiful Spring experiment can show, it lacks the golden tints of Fig. 53 and the special quality of being alive, which weaves through Fig. 53. Comparing over and over again, we come to the judgment that Fig. 53 is more alive than Fig. 52. If we allow ourselves to be guided from an artistic standpoint only, a personal note might creep in, overruling objective judgment. This personal note is understandable, if I use the term " taste " for it. On person's taste may differ from that of someone else. So if this is excluded, we decid[e] objectively from a scientific as well as an artistic view point for Fig. 53 on plate 28[e]

Plate 29, Figs. 54 and 55, and Plate 36, Fig. 68, three experiments with the same substances, 1% Gold chloride and 1% Iron sulphate, mixed in equal quantities : Of these three we also decide from a scientific and artistic view point for Fig. 55 on Plate 29, although we could understand if somebody is specially attracted by the delicate lines engraved in Fig. 68. This judgment would be made by considering the artistic point of view, and forgetting the other prominent qualities expressed in the vivid coloration, which may be better judged by having access to the original.

Plate 30, Figs. 56 and 57, and Plate 37, Fig. 70, three experiments with the same substances, Gold chloride and Tin chloride mixed in equal quantities : We choose as the most beautiful and impressive Fig. 56 on Plate 30.

Plate 31, Figs. 58 and 59, and Plate 38, Fig. 72, three experiments with the same substances, Gold chloride and Lead nitrate, mixed in equal quantities. Beyond any doubt, the picture represented on Plate 31, Fig. 59 has to be selected.

Since 1943 many friends have had opportunities to look at the originals. They were always placed before them so that they could form their own judgment. I am glad to say, that they all came to the same conclusion. It sometimes happened that the following comment was made : " I must confess that I also like the experiments with gold-tin and gold-lead carried out during the Spring Equinox, or the gold picture obtained at the same time ; they are really very beautiful. If I look afterwards at the experiments obtained on the 28th of March, I realise that there is infinitely more expressed in these ; they cannot be compared with the other two. The former are beautiful, but the latter are more than beautiful. . . ."

The one judgment comes quite naturally as an expression of admiration at the beauty of the Spring experiments. The Spring Equinox adds a great beauty. But something beyond mere beauty we find in the series made on March 28th, the Easter Sunday according to the Astronomer Royal.

The third series (Easter Sunday according to the Church authorities) judged as a whole, is more or less insignificant.

Our objective, scientific-artistic judgment of these three series of experiments is briefly :—

Nature celebrated the Easter Festival, when we commemorate the death and resurrection of Christ, on the 28th March, 1943. It was an early Easter, and everybody could see this reflected in Nature. Seeds germinated early. The trees were covered with blossoms, the Spring flowers were abundant. This glorious rising of life forces—this being in the *status nascendi*—was definitely passed a month later on the 25th of April.

These are scientific experiments which arouse in our souls religious feelings, and so contribute towards finding a way to unite Science, Art and Religion.

A scientific test enables us to decide an argument between the Astronomer Royal and the Church authorities.

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VII

PECULIARITIES IN THE MANIFESTATION OF THE FORMATIVE FORCES IN MATTER

It is of course not only Easter we can study with our experiments ; all the various festivals of the year can be traced in their reflection in Matter. But it is necessary to know, which substances can be used most advantageously at the various seasons. We came across some more peculiarities in the manifestation of the formative forces in matter. (We do not mean here those formative forces which find expression in crystallisation. These must be dealt with in another publication. In this book we refer exclusively to experiments with capillary tests, studying those formative forces which stream through substances in their liquid state). For instance we observed, that, whenever **Copper sulphate** or **Copper chloride** is used, the best results are obtained in the early part of the year : March-April-May. The same applies to **Silver salts** and **Quicksilver salts.** In the chapter about Silver nitrate, this had been sufficiently elaborated. Silver nitrate is different in Spring, Summer, Autumn, Winter. Less formative forces appear between December-January-February. **Gold salts** are very beautiful in Spring, but also later in the year. When the formative force seems to withdraw completely in experiments with Silver nitrate, Gold chloride becomes more powerful. As a rule these experiments are at their best between 10 o'clock in the morning and 2 o'clock in the afternoon. This phenomenon reverses after the Winter Solstice. For some time the best results with Gold chloride are obtained between 10 p.m. and 2 a.m.

To illustrate this, we reproduce in original colours on Plate 39, Fig. 74, an experiment with Gold chloride carried out at noon on an **Easter Sunday** and on the same Plate, Fig. 75 is the reproduction of the experiment carried out the same year on the 25th December at Midnight. Both experiments are beauiful, but completely different in colour and form, although the experiments are made with the same concentration of Gold chloride, the same filter paper is used, they are carried out in the same room under identical conditions. The night experiment at Easter is insignificant, and the day experiment at Christmas is insignificant.

It has already been stated that the pictures are painted by nature ; the scientist has to know **when** and with **what substances** he has to work, to come a step nearer the great cosmic secrets.

A subtle metamorphosis can be observed in these two experiments in the colour as well as in the form. At Easter the yellow tones rise to the top (compare our description for Easter, 1943) and the forms show the tendency to loosen, to open in an upward movement.

At Christmas the mauve and purple colours stream outside and encircle the yellow shades which have withdrawn to the inside. It is a closing in, enveloping movement at Christmas, as opposed to the opening up movement expressed in the forms at Easter.

The study of **Iron** salts shows that the formative forces in Iron act most favourable during the month of September-October-November. In November they are already declining.

Tin is at its best during Midsummer, June-July-August.

Lead in Midwinter, December-January-February.

These are only general indications for an intimate study of Matter.

Knowing all these details, after many years of experience, it is obvious that our attention during Michaelmas time is especially directed towards experiments with **Iron** sulphate and combinations of Iron sulphate with other metal salts. The last Michaelmas series of experiments yielded very impressive results and is therefore included in this publication which deals with " Spirit in Matter."

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VIII

EXPERIMENTS WITH SILVER NITRATE AND IRON SULPHATE CONDUCTED DURING MICHAELMAS TIME, 1947

The substances used are 1% Iron sulphate and 1% Silver nitrate, equal quantities mixed. We refer to the photographs on Plate No. 3, Figs. 5 and 6, as typical examples for day and night experiments. Michaelmas Day is the 29th September. It marks the time when in nature the forces of plant growth decline, fruits are gathered, and the leaves fall from the trees. Nature prepares to rest and leaves us alone. Again I wish to draw attention to the many lectures Rudolf Steiner has given about the Michael Festival, as a Festival of the Future. Man must prepare himself to be able to celebrate this festival of the year worthily. It has to become a festival of soul-activity, a festival of the courage of our souls.

The experiments with Iron sulphate and Silver nitrate of this time must be judged with the knowledge that they are not behaving normally. This is due to the fact, that two heavenly bodies, one of them connected with our experiments, are soon coming to a conjunction. Mars and Saturn will conjoin in November. This fact we have to bear in mind during all our researches, which are at the same time already a preparation for studying this astronomical event.

Plate 32, Fig. 61, 1% Iron sulphate and 1% Silver nitrate equal quantities mixed : Experiment carried out between 10 a.m. and 2 p.m. on the 21st of September : The characteristic arrow-like forms are visible. The top of the picture is strongly coloured by Iron sulphate and would normally show a stronger Silver nitrate activity. The left side is differently formed, the arrows are much more vigorously formed and grouped. But we must attribute this to the position of the various planetary bodies.

Plate 33, Fig. 63, the same experiment carried out on the 21st September between 10 p.m. and 2 a.m. of the 22nd September : Compared with the day experiment, we notice a stronger form of activity ; the rising height is considerably increased. At the left side we observe a slight disturbance moving in.

Plate 34, Fig. 65, the same experiment carried out between 10 p.m., the 27th September and 2 a.m. the 28th September : The difference between the 21st and the 27th September is very great. But in reality, this is the type of experiment to be expected to happen during the night. In a way, we could say, it returns to normal behaviour. In another direction it shows a stronger Iron activity. The whole background of the picture is vividly ochre coloured ; the rising height is identical with the one observed between the 21st and 22nd September. The single arrows are much bigger, but look through a veil of superimposed Iron sulphate. The upper part of the picture is mostly yellow coloured, with faint greyish silver lines passing through.

Plate 35, Fig. 67, the same experiment carried out between 10 p.m. on the 28th and 2 a.m. of the 29th September, *i.e.*, **Michaelmas Day.** A surprising and most impressive picture ! The normal formation of arrows partly fills the lower part ; the rising height is still higher than the day before. The upper part is harmoniously worked

through from Silver nitrate and Iron sulphate, without forming arrows. It is a soft feathery structure weaving through the whole background and in the centre, inexplicably majestic, a metamorphosis of the arrow. Studying a single arrow, we have the impression that we can clearly define the starting point, the tiny, black spot, which grows upward to the characteristic arrow. Dark shadows underneath the form, make it seem nearly three dimensional ; it looks plastic ; but we are not so sure about where the arrow ends ; it becomes lighter and lighter and finally blends into the background. The majestic central form in the experiment on Michaelmas Day is complete. The outer contour envelops completely what has been formed inside. It looks similar to the arrow and we can observe the tiny black spot from which the whole form started to build itself up. Inside appears another arrow from which light seems to exhale. Again this light figure seems enshrined in a beautiful vessel, complete in its exquisite form.

It is, needless to say, that this is to be classified as a " unique " experiment. Never has it happened in this form during all the many years of our study. Each year brings a different revelation. Of what ? I can only call it another revelation of " Spirit in Matter."

Plate 36, Fig. 69, the same experiment carried out the following day between 10 p.m., 29th September and 2 a.m., the 30th September. The substances did not rise as high as on Michaelmas Day, but they reach the same level as on the previous night between the 27th and 28th September. The picture even looks very similar to the one obtained before Michaelmas Day. There is the same vigorous formation of arrows, the same background strongly coloured by Iron sulphate ; the upper part of the picture is mostly yellow with fine lines of silver grey interwoven.

Plate 37, Fig. 71, the same experiment carried out between 10 p.m., the 30th September, and 2 a.m., the 1st October : The Iron has increased its activity and overpowered the silver to a great extent. Only at the bottom the characteristic arrows appear, and they are again much smaller, returning to their normal growth. The rising height has decreased considerably. No external reason is to be found for this phenomenon. Temperature and humidity were the same in the room.

Plate 38, Fig. 73, the same experiment carried out between 10 p.m. on the 1st and 2 a.m. of the 2nd October. The rising height has again decreased and is about the same level as the experiment of September 21st. There is still an overwhelming Iron activity. The picture is too yellow. The forms appear in the upper part and are small individually. This phenomenon of an unusual iron activity prevailed for a long time, and perhaps later on may be published in detail, in an account of the planetary influences on various metal salts.

* * * * * *

IX

WHIT SUNDAY

We have given examples so far for the reflection in experiments of the various festivals in the course of the year: Easter, St. John's Festival, Christmas and Michaelmas. It seems therefore necessary to give also an example for Whit Sunday for the sake of completeness.

We find the following comment on Whit Sunday in the Bishop of Birmingham's "The Rise of Christianity" on page 177:—

> "'Forty,' as used in ancient Jewish writings, was a conventional number. It had no precise significance; and 'forty days' meant merely a considerable, though undefined, period. But in due course, ecclesiastics desired precision that they might have a settled church calendar; and a natural wish to make a firm scheme brought into existence the sequence of Easter, Ascension Day and Whit Sunday, as we know them."

Is Whit Sunday fixed 40 days after Easter only for the convenience of a settled church calendar, or is it also a festival inscribed in the whole cosmos?

Let us return to the experiments carried out on Easter Sunday, the 28th March, 1943, and study carefully once more the result obtained for Gold chloride and Copper sulphate, the strange formation, rising above the purple arc, splitting into two separate oval forms. After Easter Sunday the substances behaved in their usual manner and we see this, when we look at the same substances used a month later, the date given by the Church for Easter Sunday, 1943. There was no Easter event streaming through Gold and Copper sulphate, it was an everyday experiment. The experiments went on and on, giving the same well-known results. Now Whit Sunday arrives.

Plate 40, Fig. 76 is the result obtained for Gold chloride and Copper sulphate on Whit Sunday. Again we must describe this experiment as "unique" in its form and colours. There was no dark purple; instead a beautiful bluish green and light purple were the main colours. These shades were not present before Easter Sunday, not on Easter Sunday, and not afterwards. They appeared on this one day only. Does not the form in the middle remind us of the one obtained on Easter Sunday? Only there it was split into two, at Whit Sunday it is only one. It is a continuation of the metamorphosis we outlined for the seven experiments on Easter Sunday. *See diagram on opposite page.*

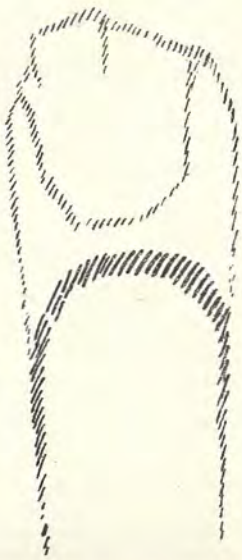

FIG. 8
Gold chloride and Copper sulphate

There is no doubt for us, that these experiments are connected, although a space of forty days separates them in time. Nature gives us the answer, that Whit Sunday is rightly placed 40 days after Easter and is not only there for a settled Church Calendar.

After Whit Sunday the copper sulphate and gold chloride experiments slip back into their normal behaviour.

It seems like a miracle that earthly substances can thus reveal to us cosmic secrets. It is time to revise our conceptions of Matter based on a completely materialistic point of view. Matter is not, as we too often think, a dead, inert mass, or a whirl of atoms and electrons, which we split again and again and use for the destruction of mankind. **Matter can become a vehicle for the Spirit,** but we must see that it is a vehicle for the Spirit of Christ and not the Anti-Christ. Let us redeem Matter from its present state, where it has fallen into the abyss of materialism, and lift it up again into the realm of spirit.

* * * * * *

LIST OF ILLUSTRATIONS

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„ 30 „ 56 1% Gold chloride and 1% Tin chloride, equal quantities, Spring Equinox, 1943.
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EIGHT DIAGRAMS

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„ 3 „ 17. Gold chloride and Copper sulphate.
„ 4 „ „ Gold chloride.
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„ 6 „ 18. Gold chloride and Tin chloride.
„ 7 „ „ Gold chloride and Lead nitrate.
„ 8 „ 27. Gold chloride and Copper sulphate.

* * * * * *

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1% SILVER NITRATE

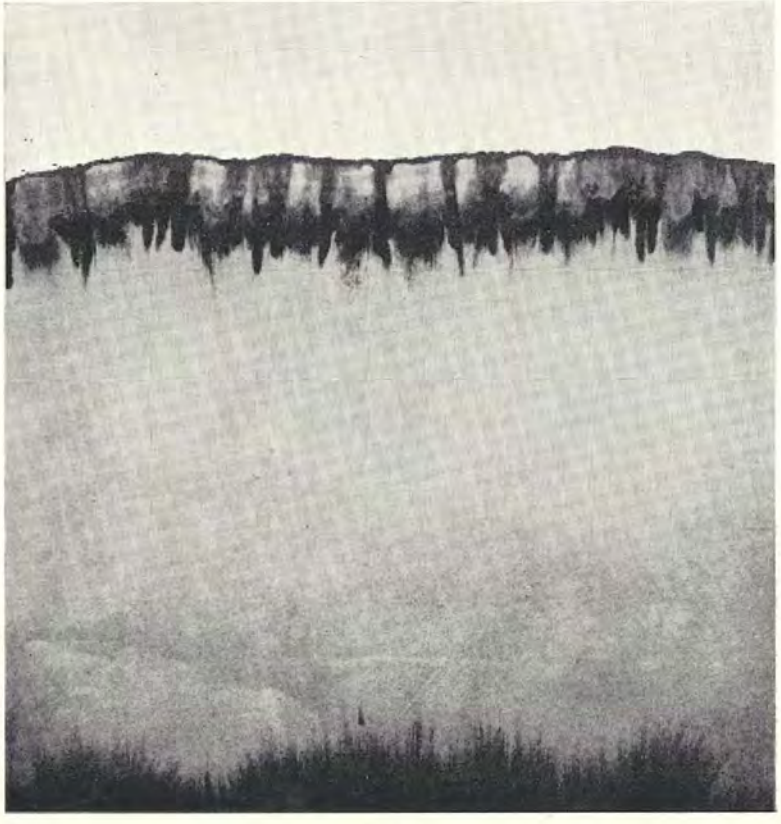

FIG. 1

Experiment carried out during Day

FIG. 2

Experiment carried out during Night

Plate 1

1% IRON SULPHATE

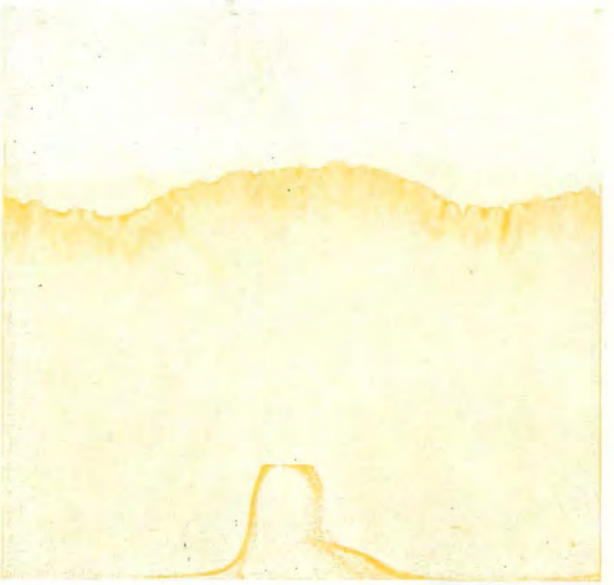

FIG. 3

Experiment carried out during Day

FIG. 4

Experiment carried out during Night

1% IRON SULPHATE & 1% SILVER NITRATE

(equal quantities)

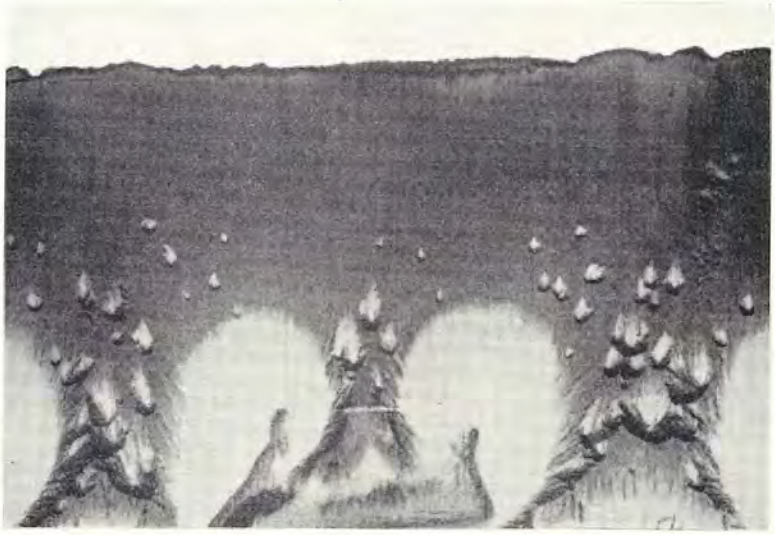

FIG. 5

Experiment carried out during Day

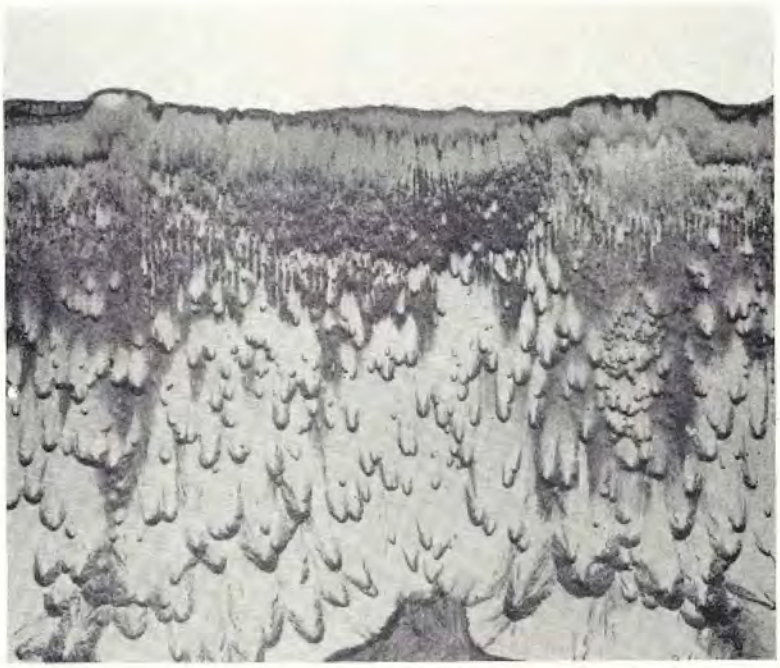

FIG. 6.

Experiment carried out during Night

1% IRON SULPHATE, 1% SILVER NITRATE AND 1% LEAD NITRATE

(equal quantities)

FIG. 7. **Experiment carried out during Day**

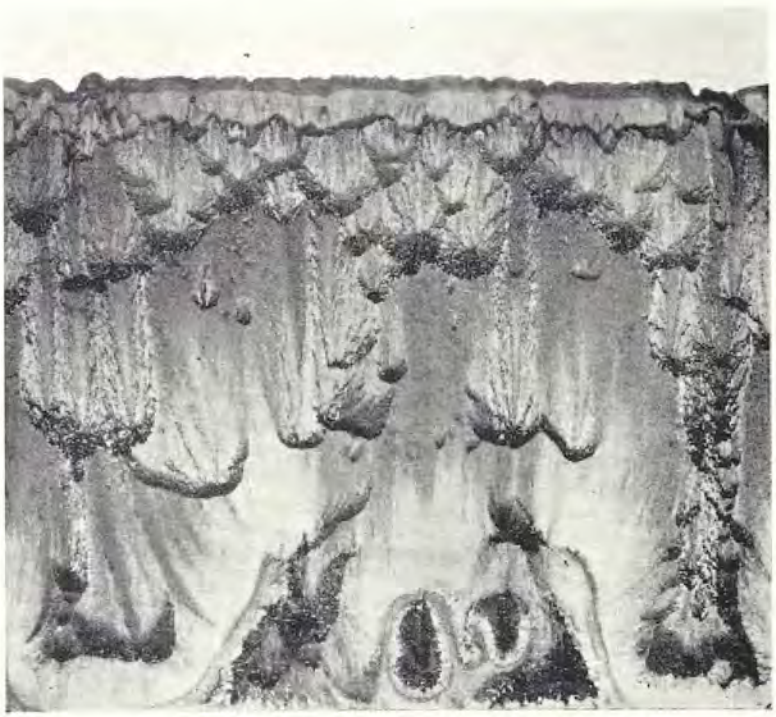

FIG. 8. **Experiment carried out during Night**

2% IRON SULPHATE

FIG. 9

Interrupted Day and Night Experiment

FIG. 10

Interrupted Day and Night Experiment

1% SILVER NITRATE

Interrupted Day and Night Experiments

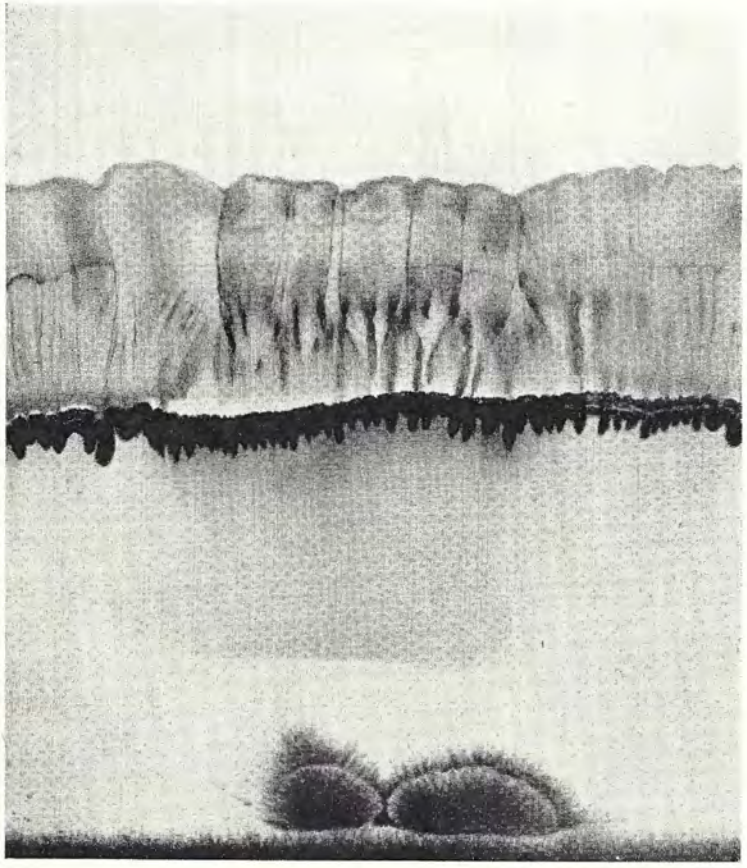

FIG. 11. **March, 1927**

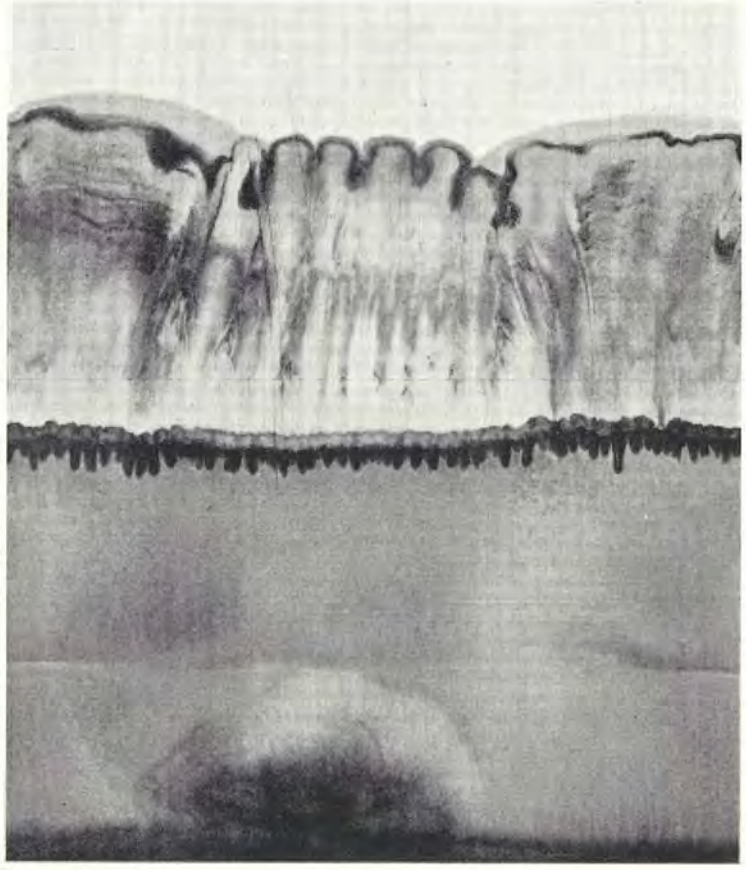

FIG. 12. **March, 1927**

1% SILVER NITRATE

Interrupted Day and Night Experiments

FIG. 13. **March, 1927. Photograph taken immediately after completing the Experiment**

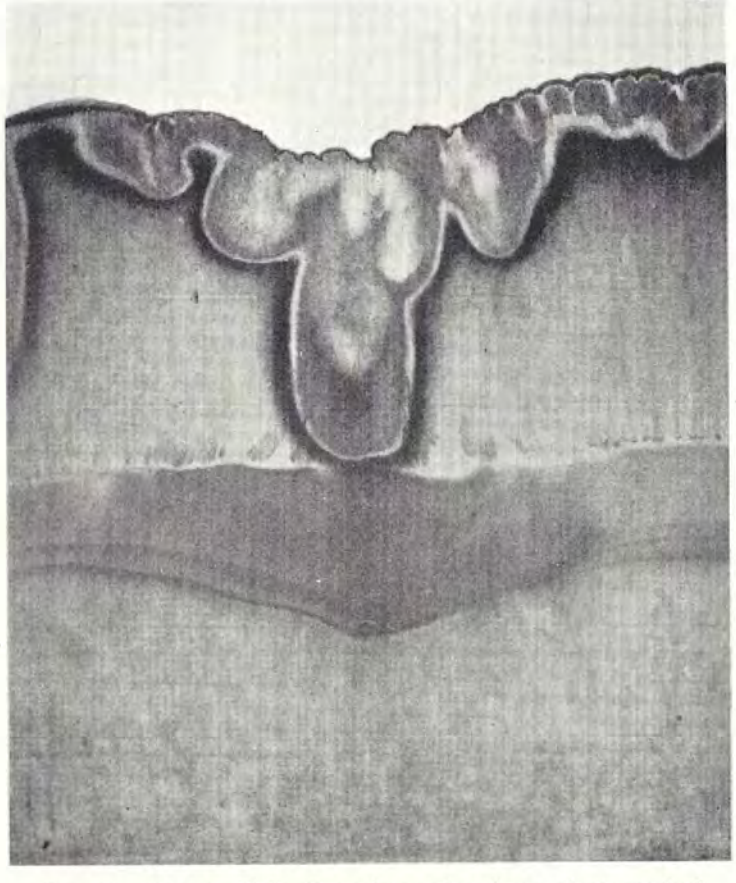

FIG. 14. **March, 1927. Experiment has been photographed again after a few days**

1% SILVER NITRATE

Interrupted Day and Night Experiments

FIG. 15. **April, 1927**

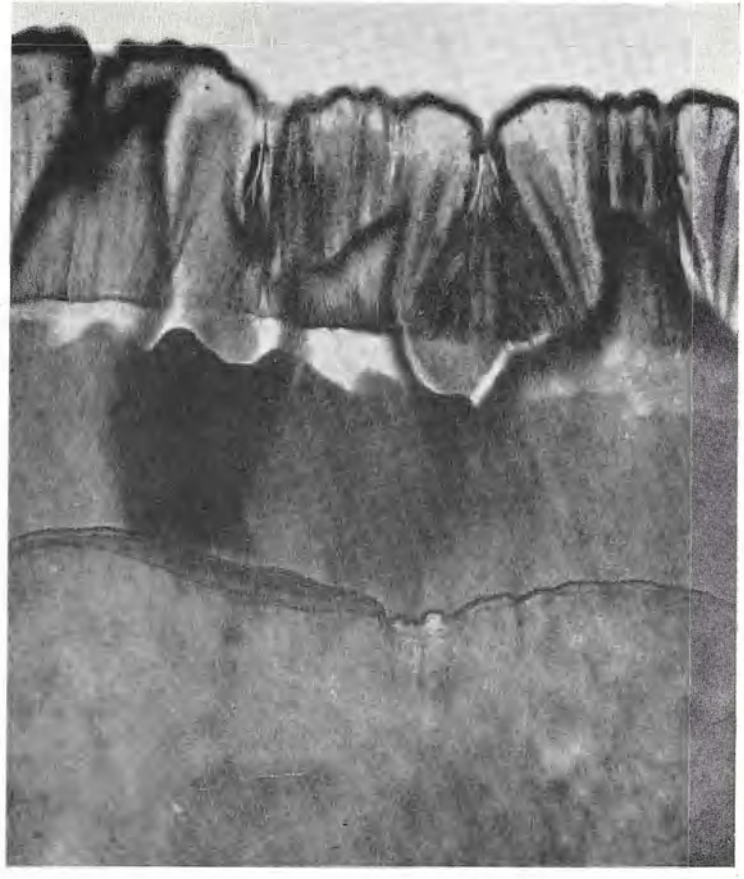

FIG. 16. **April, 1927**

1% SILVER NITRATE

Interrupted Day and Night Experiments

FIG. 17. **May, 1927**

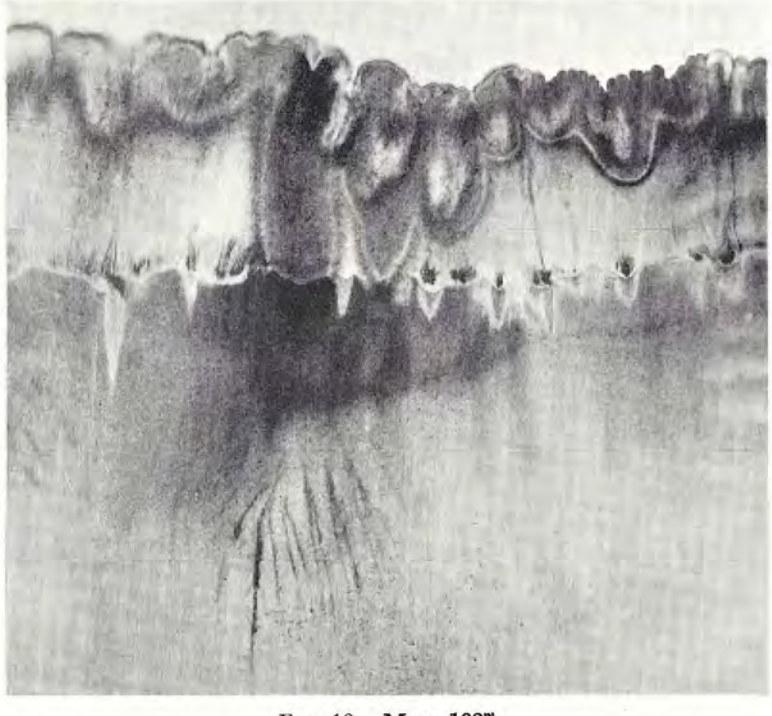

FIG. 18. **May, 1927**

1% SILVER NITRATE

Interrupted Day and Night Experiments

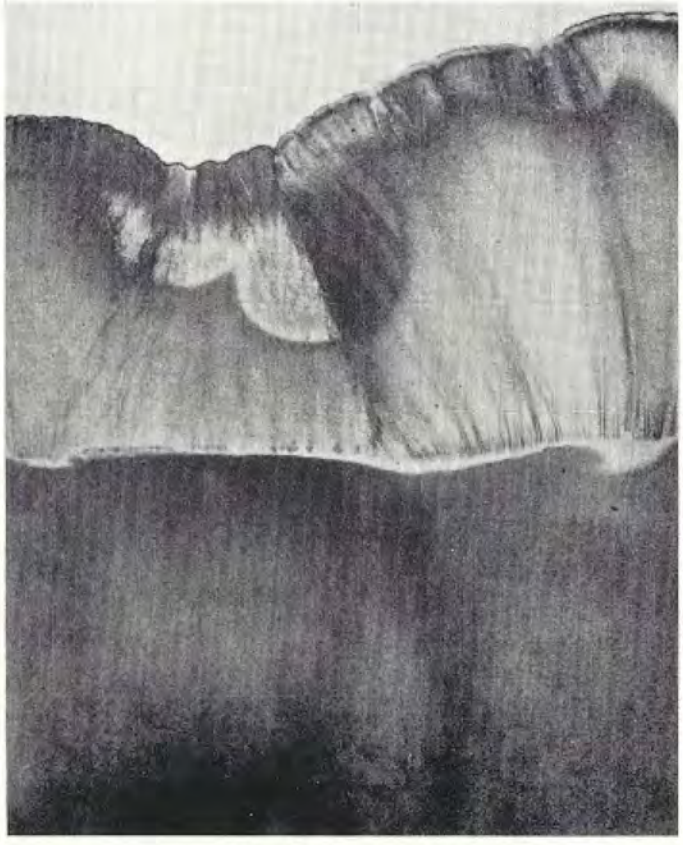

FIG. 19. **June, 1927**

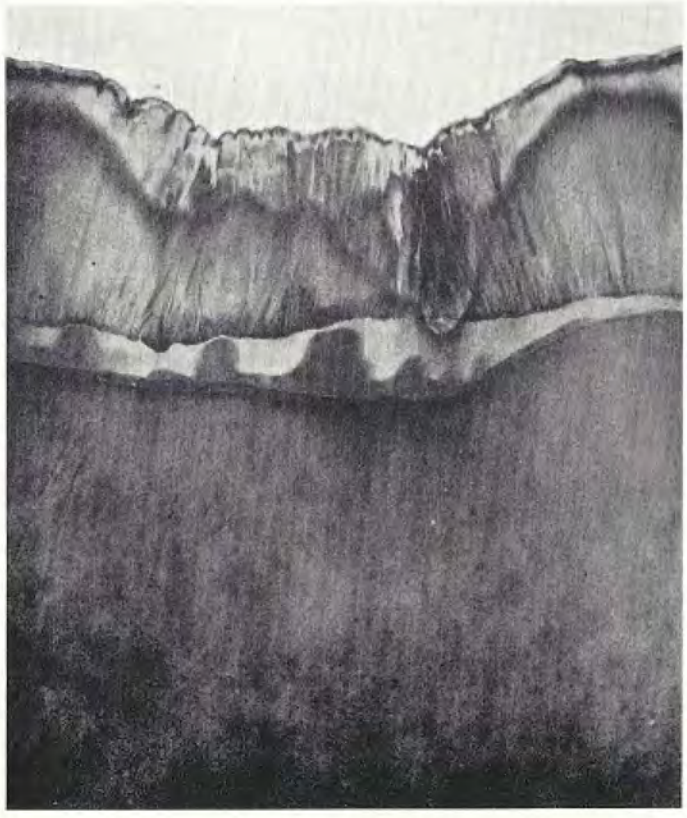

FIG. 20. **June, 1927**

1% SILVER NITRATE

Interrupted Day and Night Experiments

FIG. 21. **July, 1927**

FIG. 22. **July, 1927**

1% SILVER NITRATE

Interrupted Day and Night Experiments

FIG. 23. **August, 1927**

FIG. 24. **August, 1927**

1% SILVER NITRATE

Interrupted Day and Night Experiment

FIG. 25. **September, 1927**

First photo taken immediately after 24 hours

FIG. 26. **September, 1927**

Second photo taken a few days later

1% SILVER NITRATE

Interrupted Day and Night Experiment

FIG. 27. **September, 1927**

Third photo taken two weeks later

FIG. 28. **September, 1927**

Fourth photo taken four weeks later

1% SILVER NITRATE

Interrupted Day and Night Experiments

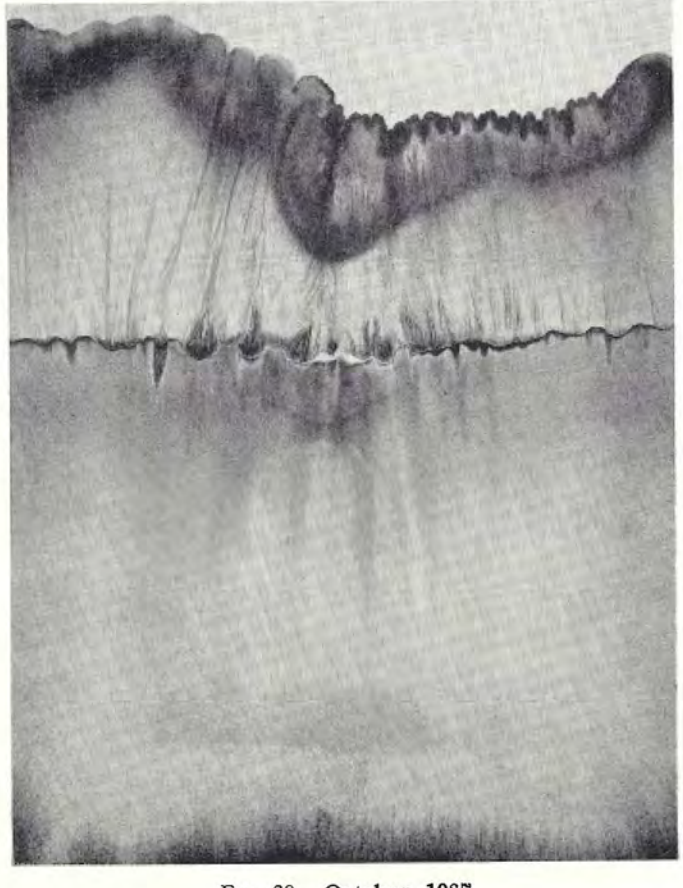

FIG. 29. **October, 1927**

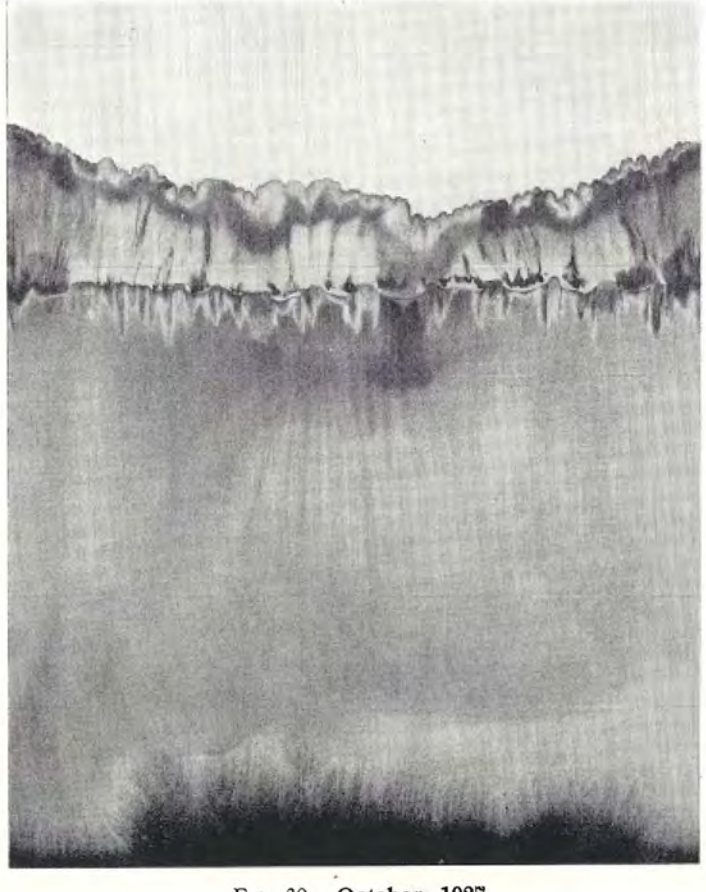

FIG. 30. **October, 1927**

1% SILVER NITRATE

Interrupted Day and Night Experiments

FIG. 31. **November, 1927**

FIG. 32. **November, 1927**

1% SILVER NITRATE

Interrupted Day and Night Experiments

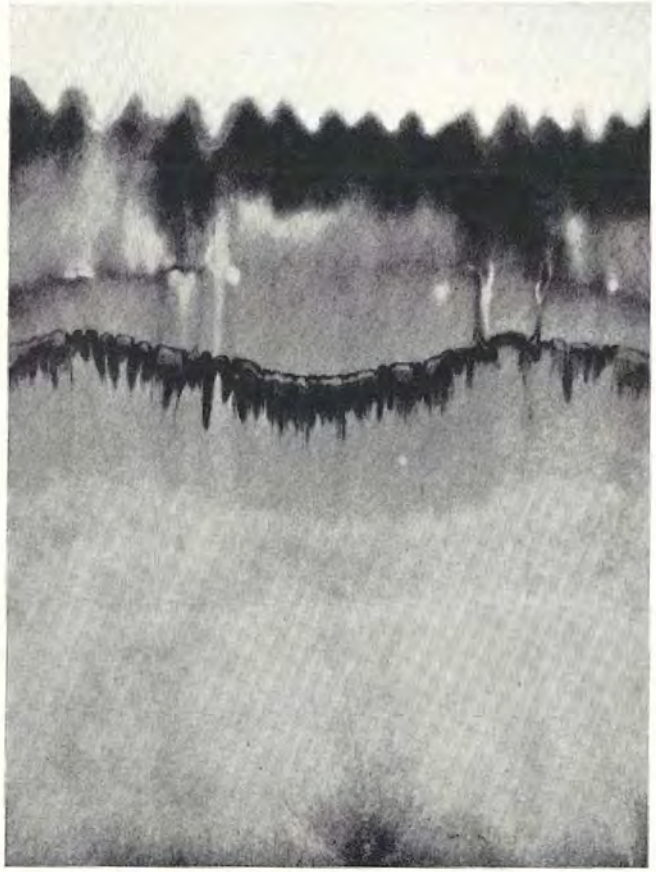

FIG. 33. **December, 1927**

FIG. 34. **December, 1927**

1% SILVER NITRATE

Interrupted Day and Night Experiments

FIG. 35. **January, 1928**

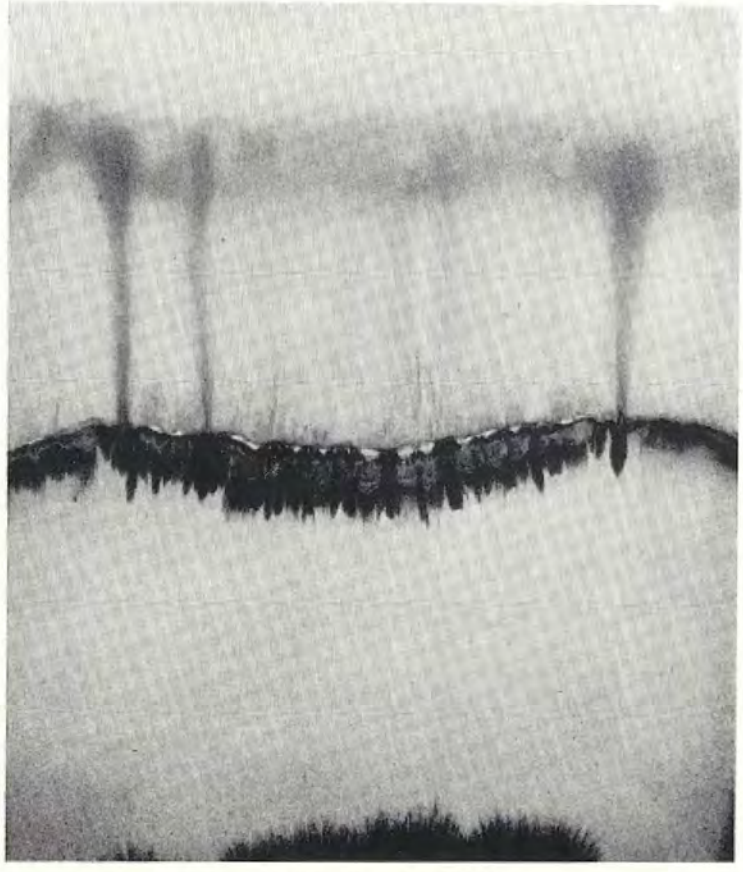

FIG. 36. **January, 1928**

1% SILVER NITRATE

Interrupted Day and Night Experiments

FIG. 37. **February, 1928**

FIG. 38. **February, 1928**

1% SILVER NITRATE

Interrupted Day and Night Experiments

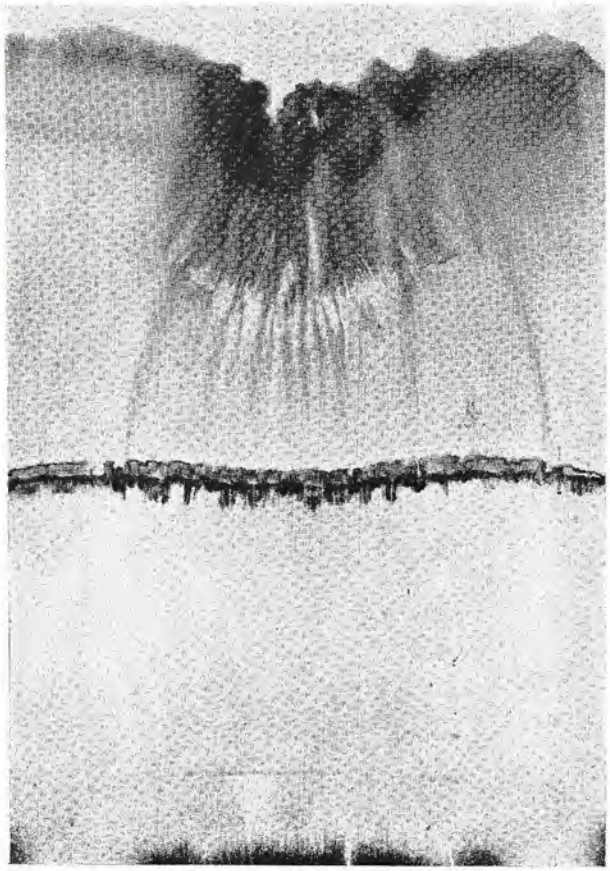

FIG. 39. **March, 1928**

FIG. 40. **March, 1928**

1% SILVER NITRATE

Interrupted Day and Night Experiments

FIG. 41. **April, 1928**

FIG. 42. **April, 1928**

1% SILVER NITRATE

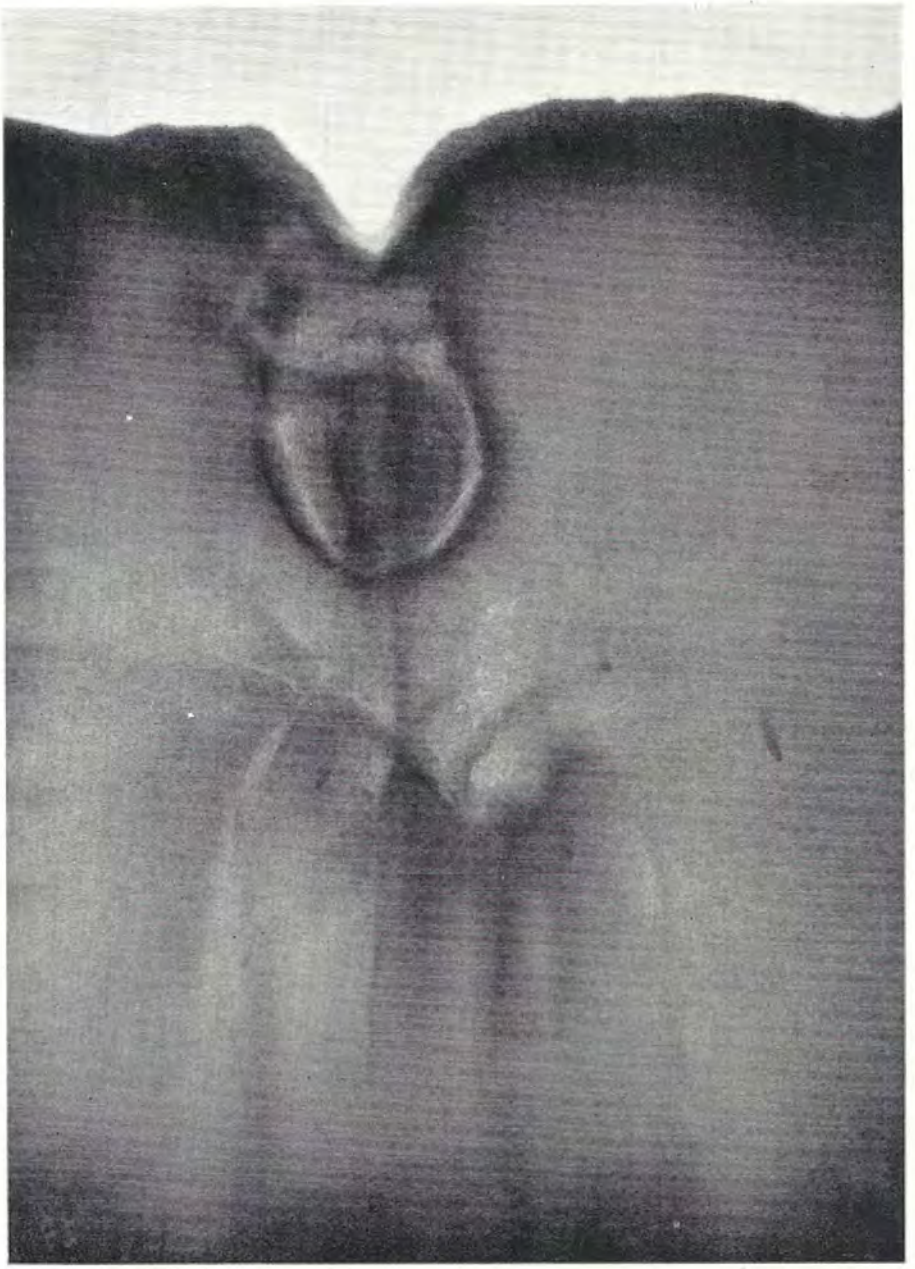

FIG. 43

EASTER SUNDAY, 1927

1% SILVER NITRATE

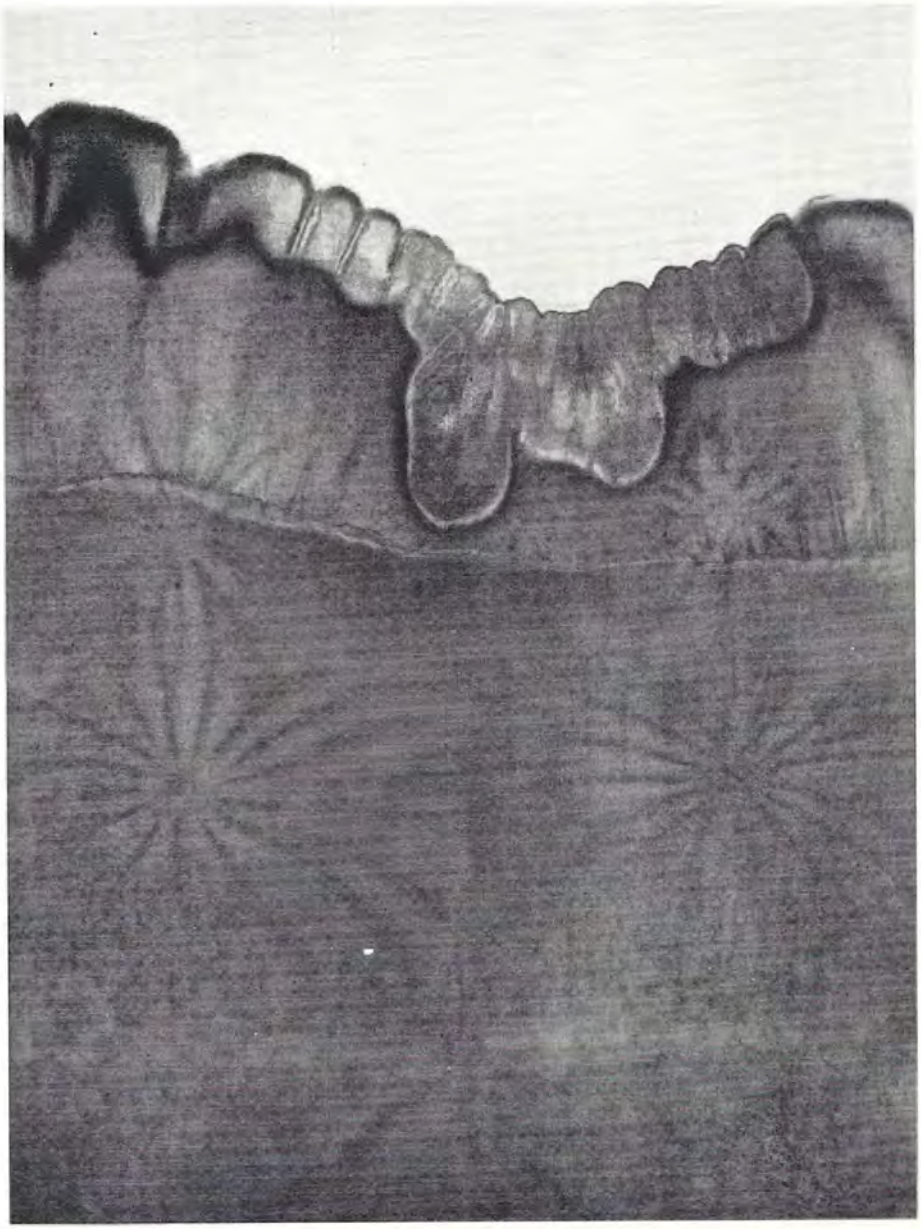

FIG. 44

ST JOHN'S FESTIVAL, 24th June, 1927.

1% SILVER NITRATE

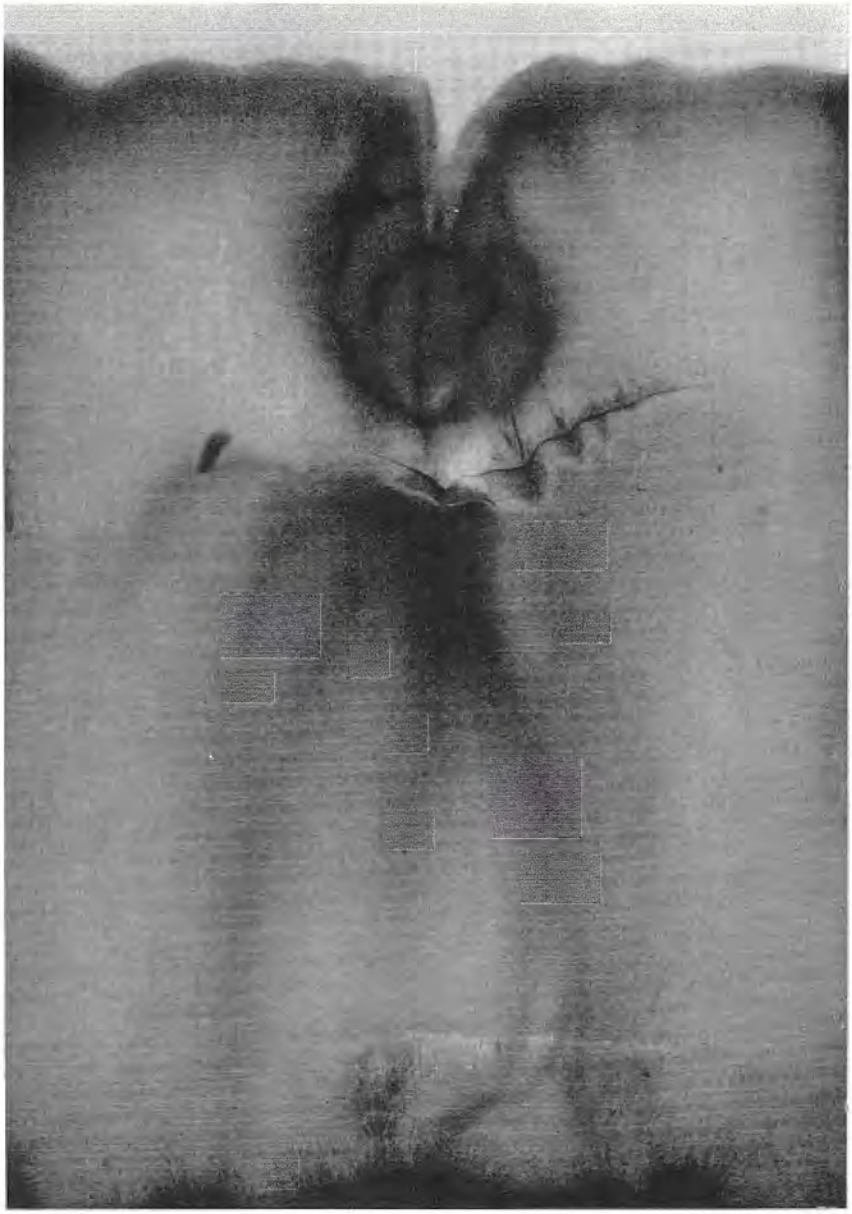

FIG. 45

EASTER SUNDAY, 1928

1% GOLD CHLORIDE & 1% SILVER NITRATE

(equal quantities)

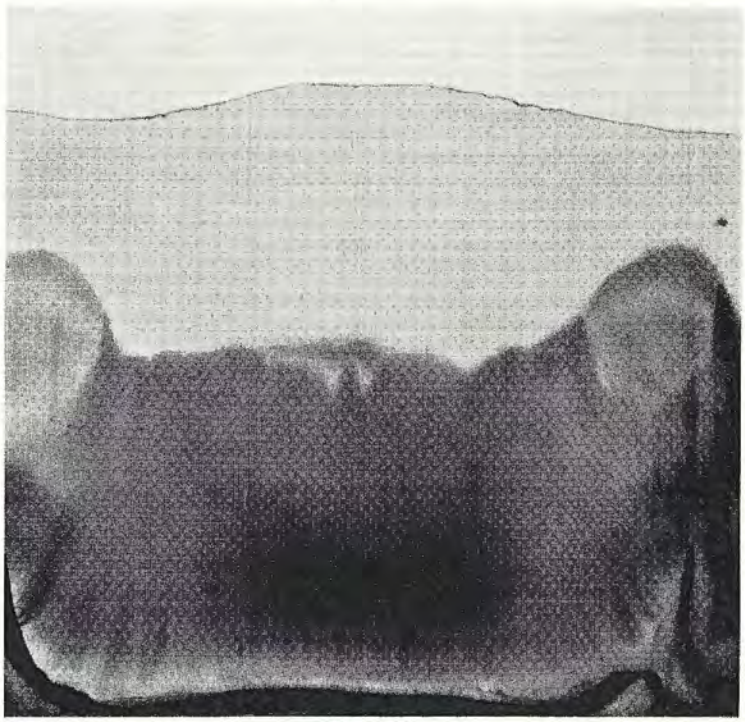

FIG. 46
Spring Equinox, 1943

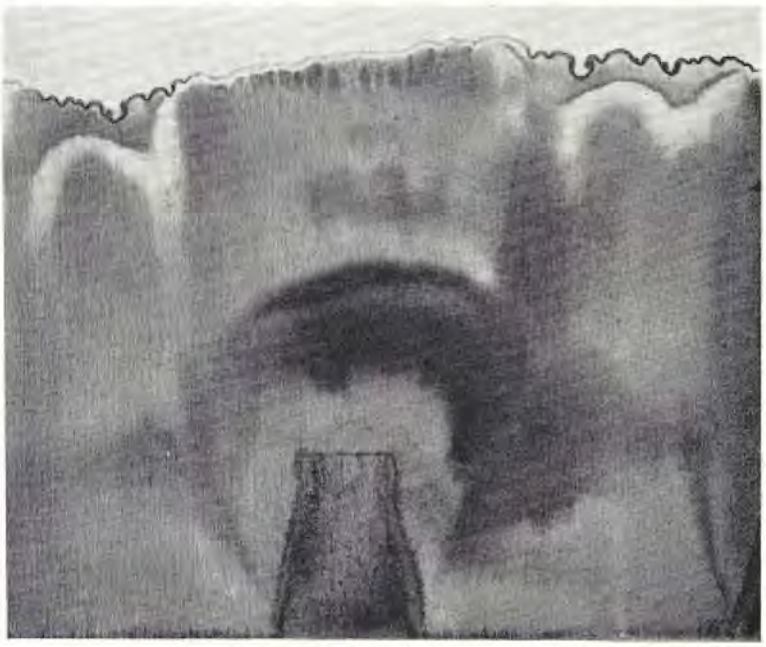

FIG. 47
28th March, 1943

1% GOLD CHLORIDE & 1% QUICKSILVER CHLORIDE

(equal quantities)

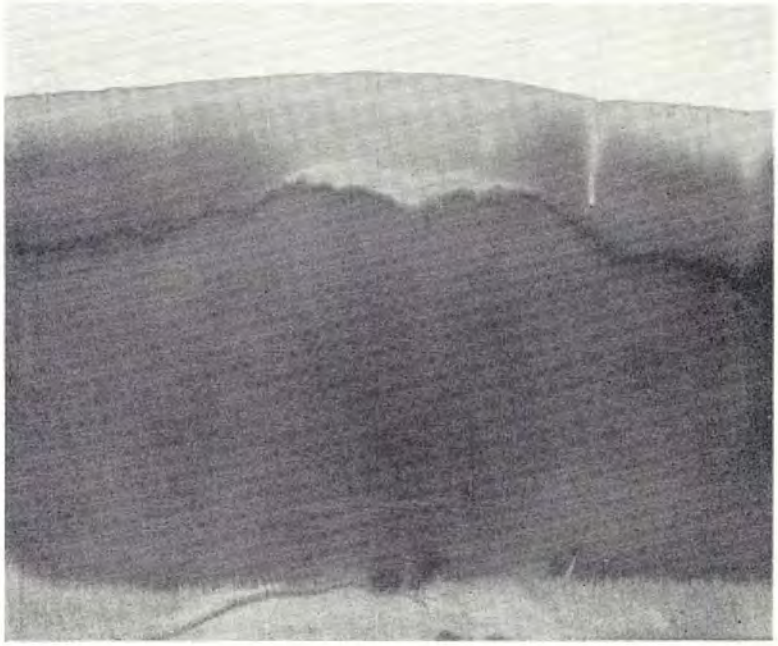

FIG. 48
Spring Equinox, 1943

FIG. 49
28th March, 1943

1% GOLD CHLORIDE & 1% COPPER SULPHATE

(equal quantities)

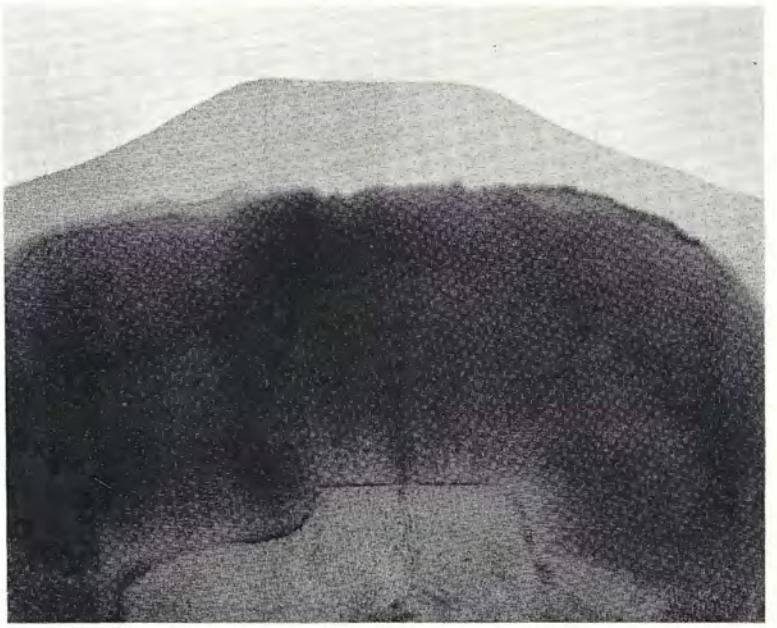

FIG. 50
Spring Equinox, 1943

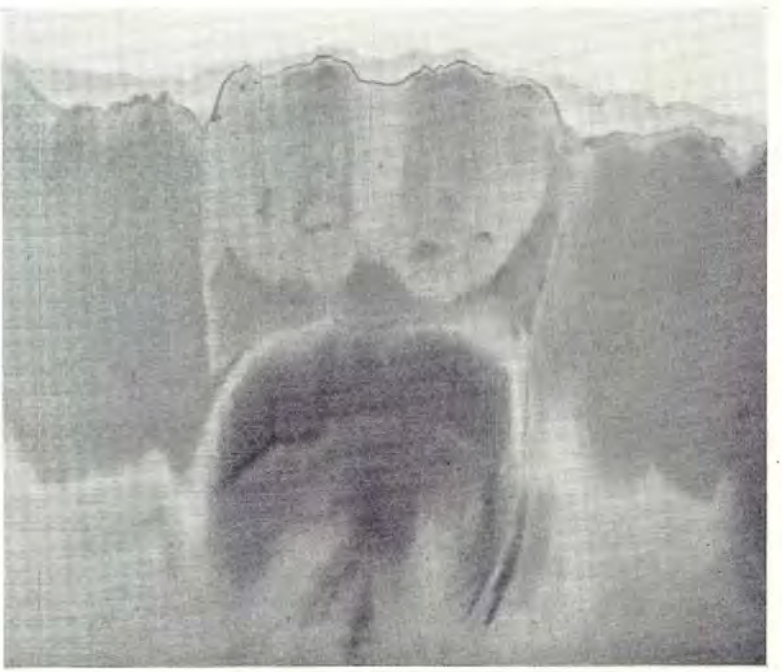

FIG. 51
28th March, 1943

1% GOLD CHLORIDE

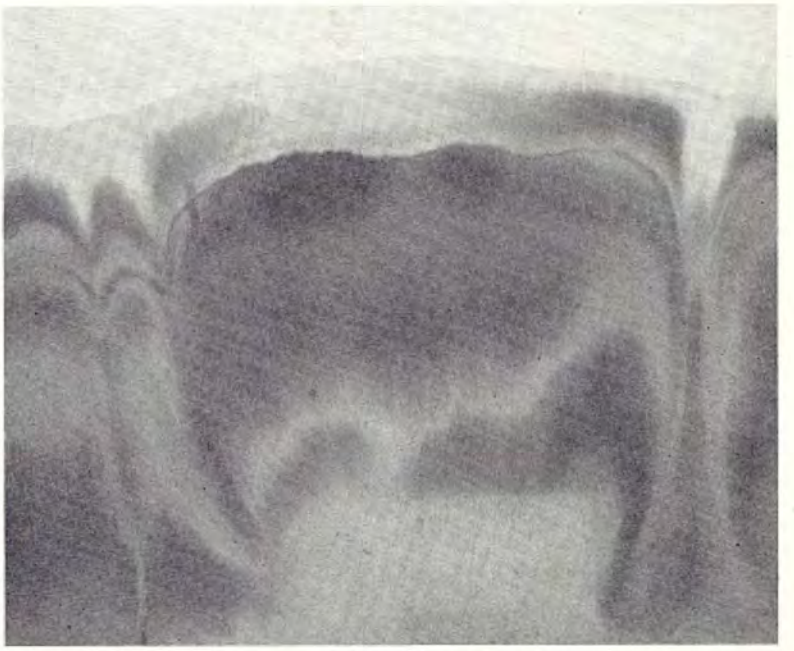

FIG. 52
Spring Equinox, 1943

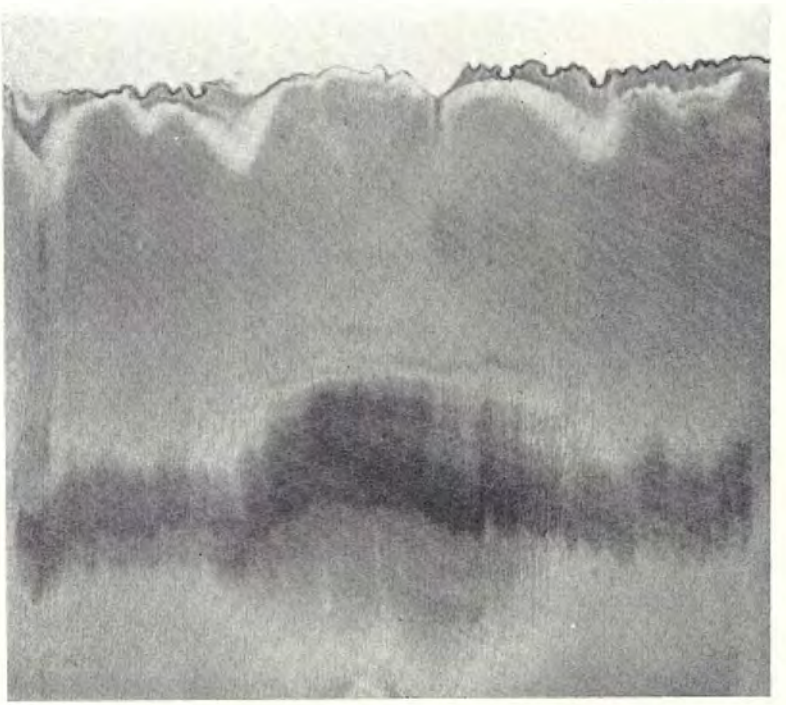

FIG. 53
28th March, 1943

1% GOLD CHLORIDE & 1% IRON SULPHATE

(equal quantities)

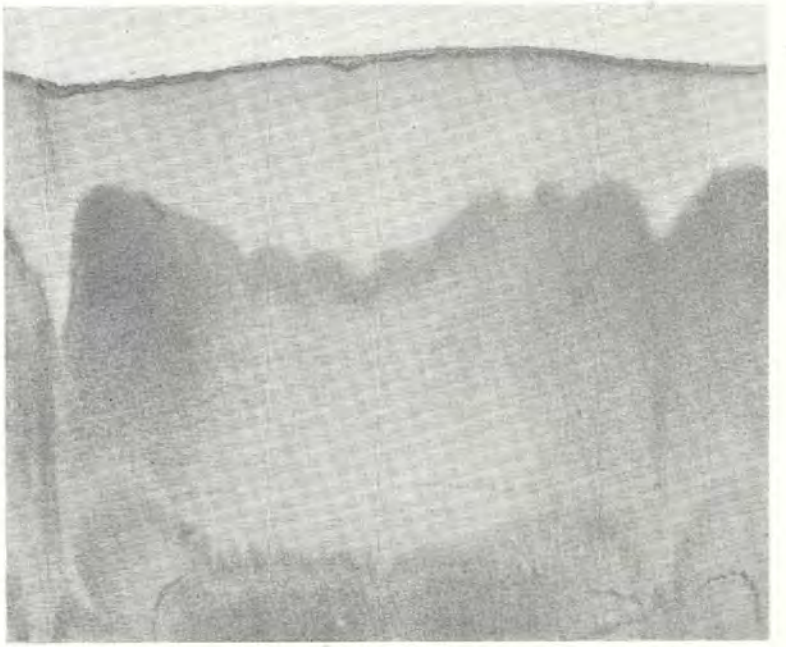

FIG. 54

Spring Equinox, 1943

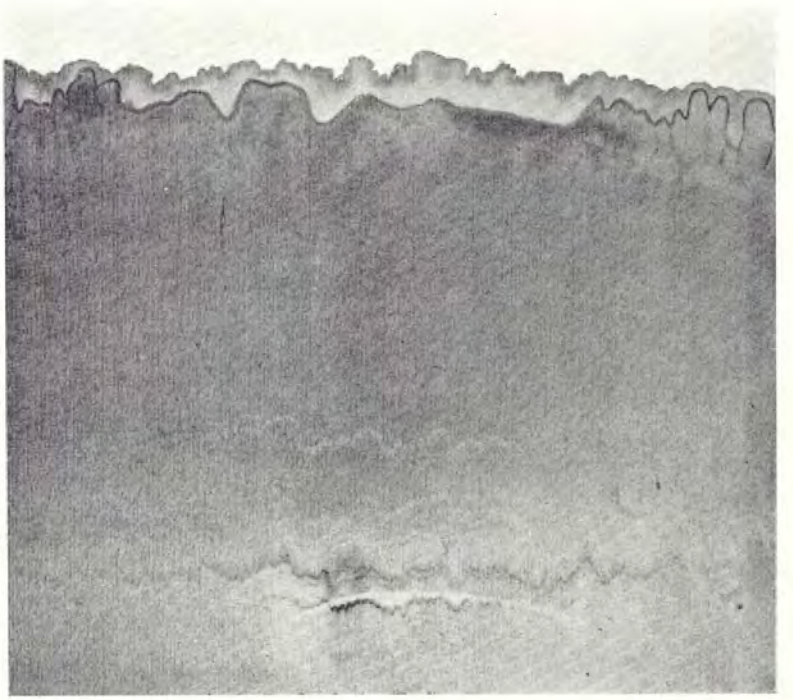

FIG. 55

28th March, 1943

1% GOLD CHLORIDE & 1% TIN CHLORIDE

(equal quantities)

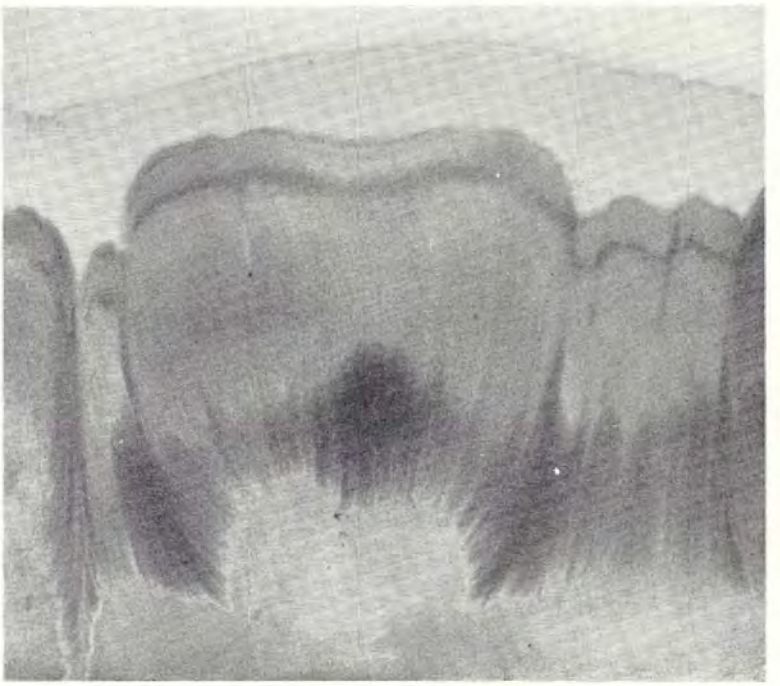

FIG. 56

Spring Equinox, 1943

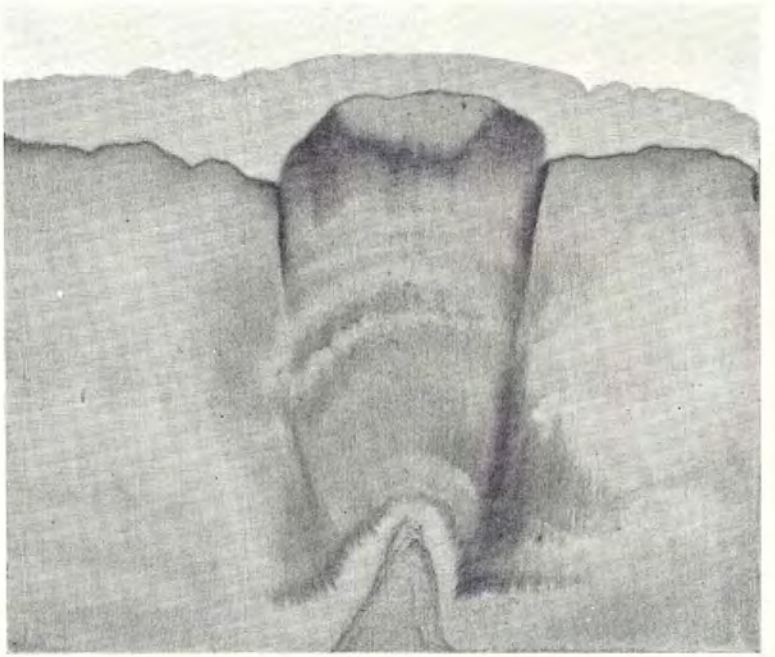

FIG. 57

28th March, 1943

1% GOLD CHLORIDE & 1% LEAD NITRATE

(equal quantities)

FIG. 58

Spring Equinox, 1943

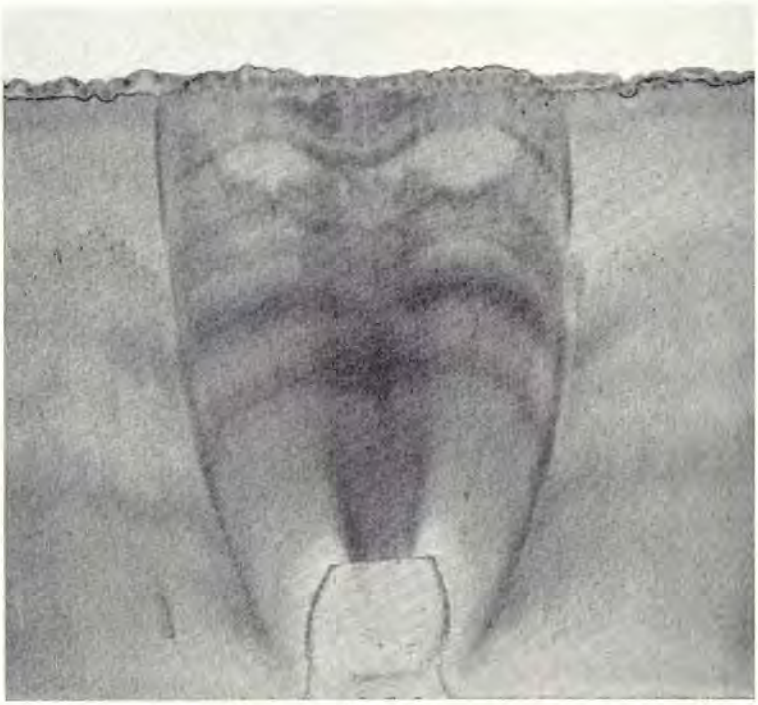

FIG. 59

28th March, 1943

1% GOLD CHLORIDE & 1% SILVER NITRATE

(equal quantities)

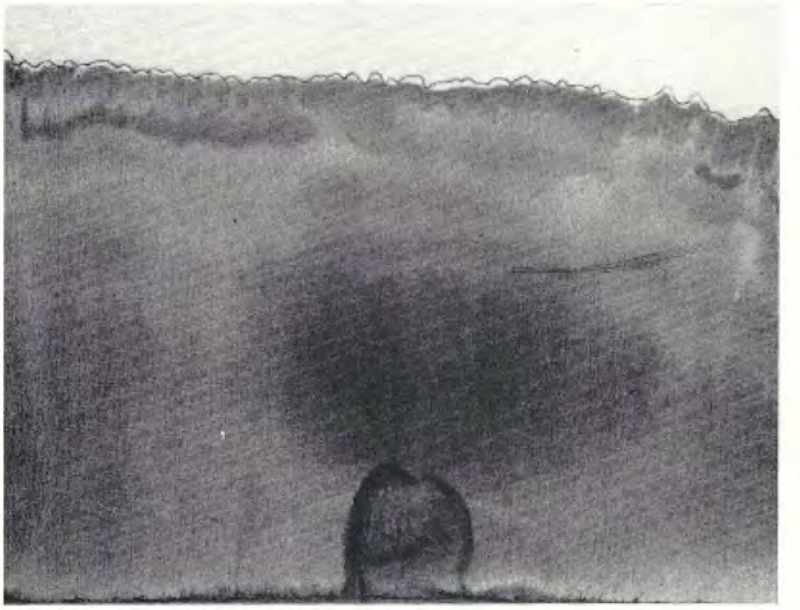

FIG. 60

25th April, 1943

1% SILVER NITRATE & 1% IRON SULPHATE

(equal quantities)

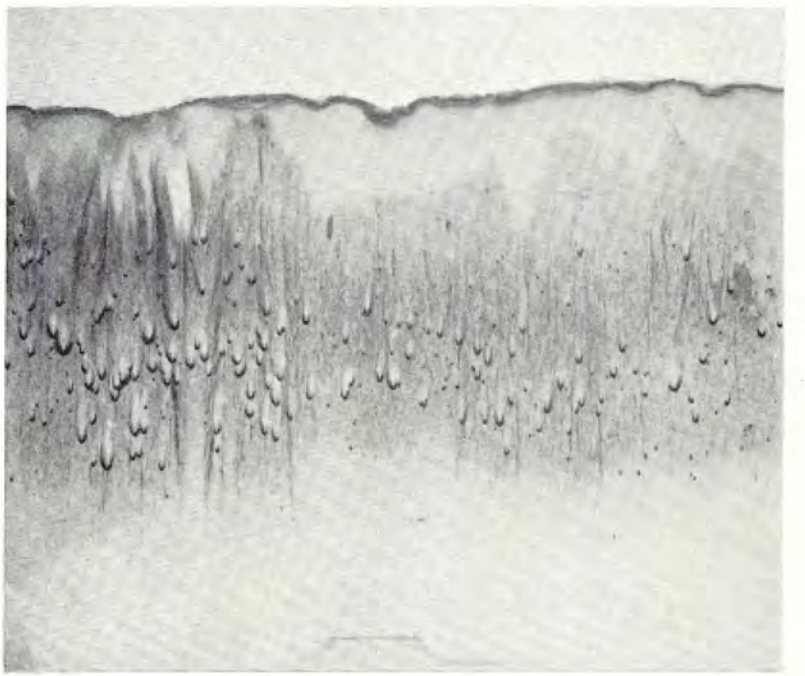

FIG. 61

Experiment carried out at noon, 21st September, 1947

1% GOLD CHLORIDE & 1% QUICKSILVER CHLORIDE
(equal quantities)

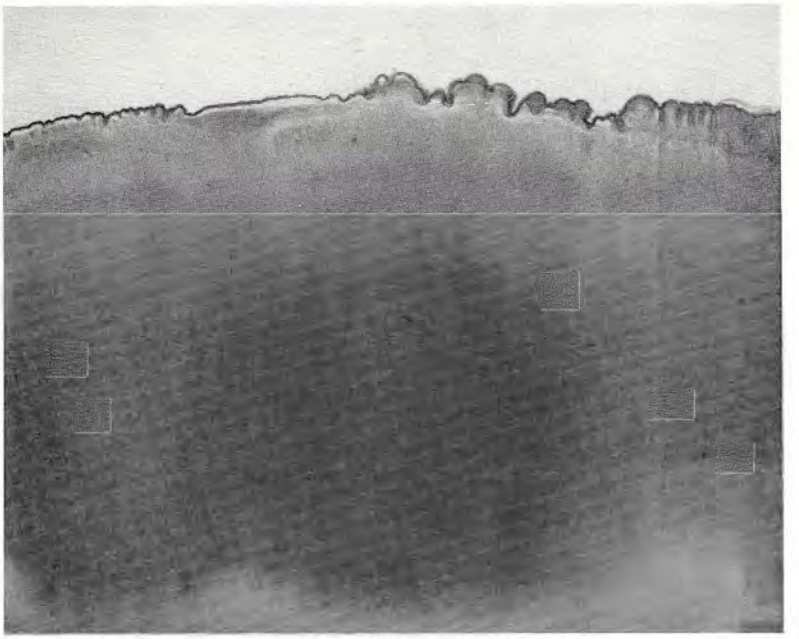

FIG. 62. **25th April, 1943**

1% SILVER NITRATE & 1% IRON SULPHATE
(equal quantities)

FIG. 63. **Experiment carried out at midnight, 21st September, 1947**

1% GOLD CHLORIDE & 1% COPPER SULPHATE
(equal quantities)

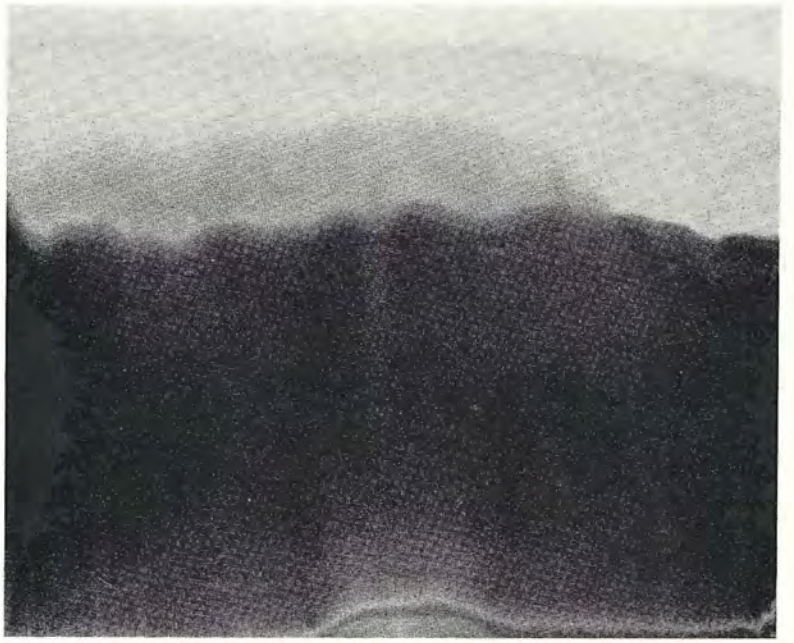

FIG. 64. **25th April, 1943**

1% SILVER NITRATE & 1% IRON SULPHATE
(equal quantities)

FIG. 65. Experiment carried out between the 27th and 28th September, 1947

1% GOLD CHLORIDE

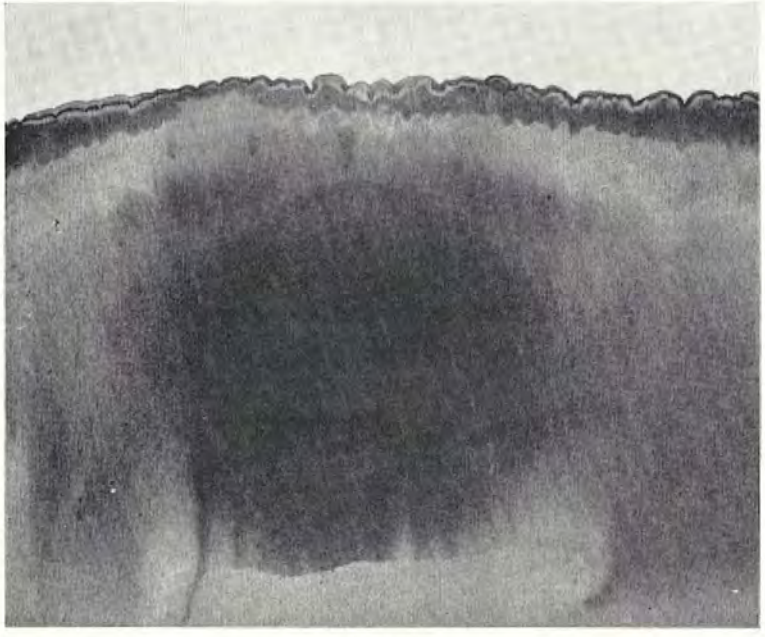

FIG. 66
25th April, 1943

1% SILVER NITRATE & 1% IRON SULPHATE
(equal quantities)

FIG. 67
Experiment carried out between 28th and 29th September, 1947, Michaelmas Day

1% GOLD CHLORIDE & 1% IRON SULPHATE
(equal quantities)

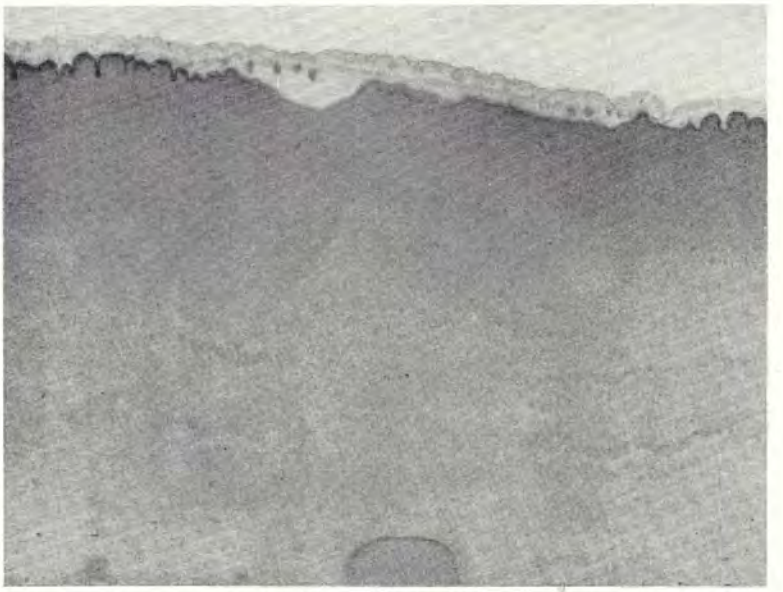

FIG. 68. **25th April, 1943**

1% SILVER NITRATE & 1% IRON SULPHATE
(equal quantities)

FIG. 69. **Experiment carried out between 29th and 30th September, 1947**

1% GOLD CHLORIDE & 1% TIN CHLORIDE

(equal quantities)

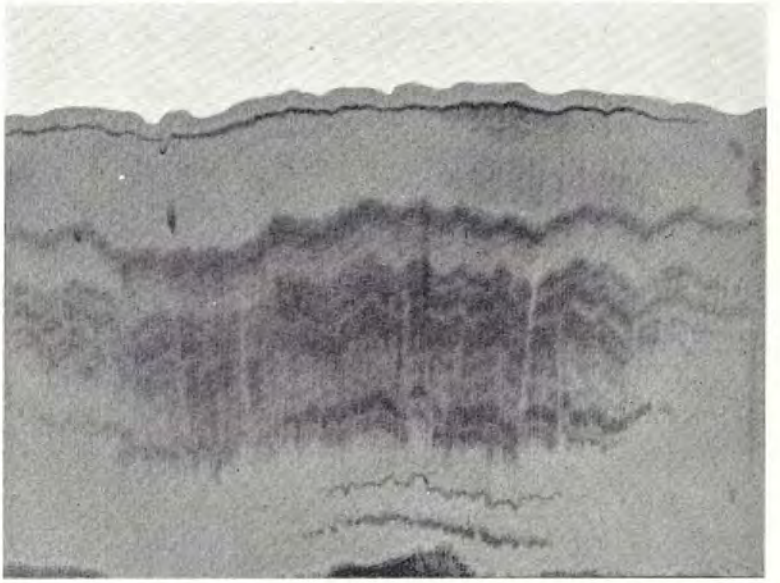

FIG. 70

25th April, 1943

1% SILVER NITRATE & 1% IRON SULPHATE

(equal quantities)

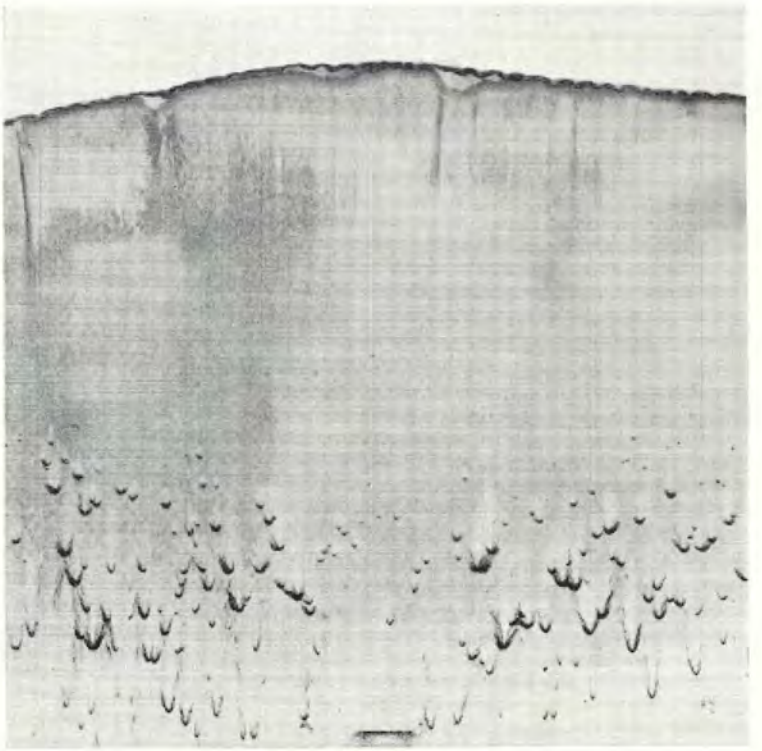

FIG. 71

Experiment carried out between the 30th September and 1st October, 1947

1% GOLD CHLORIDE & 1% LEAD NITRATE
(equal quantities)

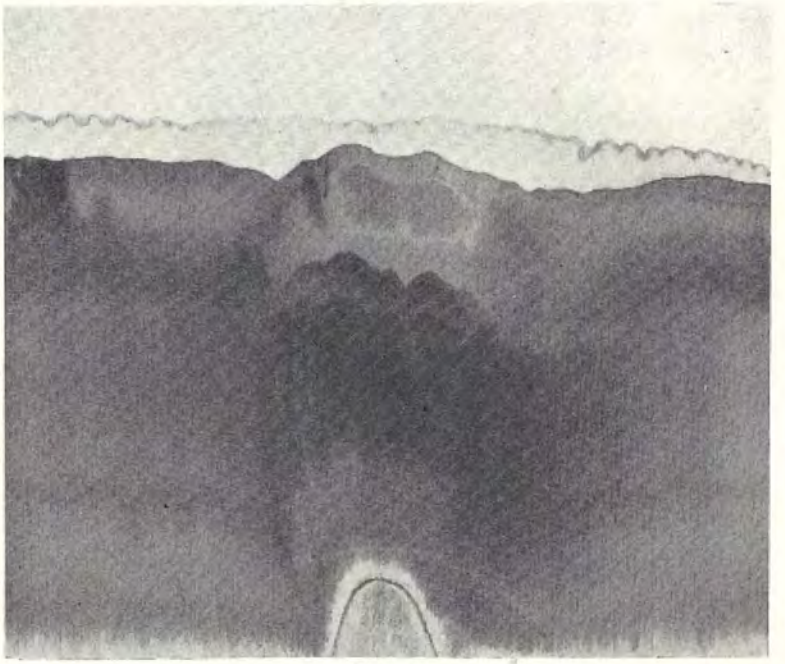

FIG. 72
25th April, 1943

1% SILVER NITRATE & 1% IRON SULPHATE
(equal quantities)

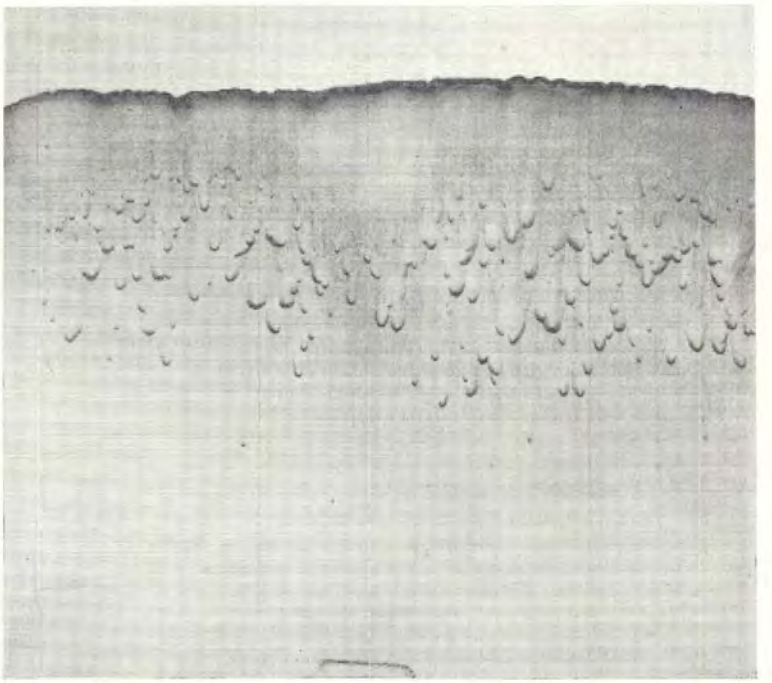

FIG. 73
Experiment carried out between 1st and 2nd October, 1947

GOLD CHLORIDE

FIG. 74
Easter Sunday, 1929
Experiment carried out at noon

GOLD CHLORIDE

FIG. 75
Christmas, 1929
Experiment carried out at midnight

1% GOLD CHLORIDE & 1% COPPER SULPHATE

(equal quantities)

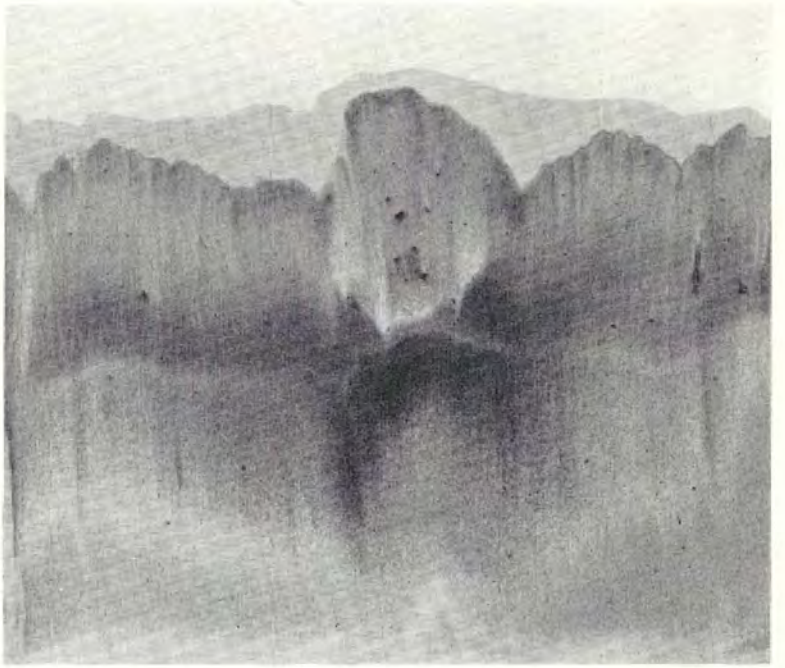

FIG. 76

Experiment carried out on Whit Sunday, 1943