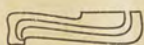


World's fair St. Louis 1904.

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Collective Exhibition  
of the  
German Amber Industrie.

Exhibited by the  
Prussian Ministerial Department for Trade and Industry.



Prof. Dr. R. Klebs,  
Manager and Director.

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Guide.



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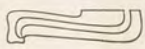
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All information concerning the articles on exhibition, including their immediate sale or negotiations can be obtained from the Director Prof. Dr. Klebs, or in his absence from his assistant, Miss Margaret Richter. Business cards and complete price lists of the various exhibits can be had free of charge on application.



## Guide.

Of all natural products there is none that awakes such wide spread interest as amber. Its rarity confined as it is to a limited region, the many differences between it and all other precious stones, its fire, its varied colouring, its peculiarity of attracting small bodies, all these qualities caused amber to be deeply interesting to and highly prized by the ancients as a means of ornament.

A beautiful and poetic fable represented amber as a gift of the gods, made to flow from the eyes of beautiful women and to be caught up by the clear stream of Erydanus.

Although highly prized in ancient times amber has always maintained its popularity. Though proud queen Fashion sometimes banished it out of her following, it was much in favour in other places. Its intrinsic worth which was far higher than gold in olden times sank considerably at a later period. Now it could certainly not be taken as a criterion of the wealth of its wearer like its haughty kindred sorts, the crystals of coal (diamond) and of argillaceous earth (ruby). Its peculiar yellow colour quite different from that of any other stone, has at least always preserved it from falling into oblivion and has periodically, as at the present time brought it into fashion. The Collective Exhibition of the German Amber Industry gives not only a general idea of the various uses to which amber



is put at the present time, not only in art but in industry, but it is also meant to show that amber excels, in scientific importance, every other mineral whether from archaeological, geological or paleontological standpoint.

### I. Origin.

In compiling the history of the development of the human race, whether our knowledge is derived from studying objects found in tombs or from written tradition, every discovery of amber is a link which connects with certainty the gem with its origin.

The information which it gives us is not confined to the development of human intercourse and commerce, but its deposit, shape, colour, condition and specially by its peculiar property of containing fragments of plants and animals give us a picture of its own formation, telling us of an epoch far earlier than our own.

Hereby we not only learn the character of the flora and fauna, but we are in a position to draw useful conclusions as to other biological and climatic conditions, a possibility which is not offered in any other aera of our globe.

When we look back on the genesis of our earth we find constant changes in the limits between land and water: we find here the disintegration of solid rock, and there the deposit of what has been destroyed. In that period to which science gives the name of tertiary system and in its subdivision Eocene — the time of the dawn of the present animal and plant forms — the division of land and water on the earth's surface was quite different from what it is in the present day.

At the beginning of that period the whole of Europe was covered by a sea out of which small parts of the continent of to day projected like islands. Our highest mountains, the Alps, the Pyrennees and the Appennines were either completely or nearly submerged, and emerged very

slowly from the water during the immense length of time which these periods must have lasted. Towards the close of the Tertiary period, they had attained a height very much greater than they have at present.

Where the Baltic Sea is now situated there was formerly land, the southern limit of which was not very far from the shore of the Baltic of to day. This land was the home of amber.

On calcareous soil of the chalk formation which had risen from out the sea, there grew under the heat of an almost tropical sun, a luxuriant vegetation composed for the most part of resinous trees.

For thousands of years this virgin forest must have stood, one generation of trees supplanting the other in the constant struggle for light and space. The trunks may have been smitten by disease, whole stretches laid down by the tempest and being thus exposed to the attacks of insects and fungi, the trees would exude their resin to cover their wounds. While in the course of time the woody parts rolled and their decomposed atoms raised the level of the soil, the indestructible resin remained lying in it and accumulated.

— „Amber is one of these resins.“ —

Welling out of its mother plant in a soft sticky mass, it held here a blossom, a leaf or a splinter of wood, there some small animal whose strength did not suffice to free itself from its transparent grave.

Though such pieces of amber, enclosing more especially vegetable matter, may not be very plentiful, still they are sufficient to teach us the vegetation of that remote virgin forest as completely as in a herbarium.

From this remains it is shown that the vegetable and animal life of that period have a close connection with that existing at the present day in the south western parts of North America and in Japan.



The character of the amber forest is distinguished by a great number of oaks and conifers, especially of the group of Tuja, among which are found Cameliaceae, Lauraceae and representatives of very numerous other families of all departments of botany.

We are chiefly interested in the stock plant of amber.

The characteristic properties of conifers are shown in a microscopic examination. Every specimen of wood enclosed in amber displays these properties peculiar to conifers. Unfortunately this in itself is not sufficient to determine the species with certainty; leaves and blossoms are also required and a specimen of amber containing both the wood and the leaves belonging to it has not yet been found. Awaiting this happy chance it must remain an open question whether the amber conifers belong to the genus Pinus or Picea. Therefore it is best to give the stock plant of amber Göppert's designation: „*Pinites succinifer* Göp.“ which leaves it indefinite whether it is a pine or a fir-tree.

**No. 1—10.** Nos. 1—10 are specimens adapted to show the process of formation of amber.

**No. 1.** No. 1 (*Exhibitor: Professor Dr. R. Klebs, Kgl. Landesgeologe, Königsberg*). Remains of a former amber tree.

Woody remains of the *Pinites succinifer* are very rare. Notwithstanding the fact that many hundred thousand cubic-metres of amber-bearing soil have been already thoroughly sifted and washed in order to discover the smallest fragment of amber, and that the workmen have collected every atom of foreign substance with such care, that it would have been impossible to miss anything, nevertheless remains of the amber trees were extremely rare. This rarity is explicable as follows: When the amber bearing land was submerged, the woody parts floated and were carried away by the water to great distances. Only amber and heavy pieces of wood, containing resinous oils or on which pieces of amber



still adhered, sank and were deposited. Several of these pieces of wood have been rolled along and thus bear evidence, that water was the cause of the removal.

No. 2 Unique specimen. — (*Exhibitor: Landes-geologe Dr. R. Klebs, Königsberg*). Remains of a trunk of foliage tree. No. 2.

This specimen is the only one of its kind and excites great interest on account of its spongy appearance caused by white ants (Termites).

Nos. 3—10 (*Exhibitors: Royal Amberworks and Professor Dr. R. Klebs, Königsberg*). In these cases a number of specimens are exhibited which serve to show the process of amber formation. This process took the same course as the formation of resinous exudations in pine woods at the present time. No. 3—10.

The resin exuded from the *Pinites succinifer* at every injury to the trunk, solidified in various forms on the trunk and became amber when completely dried.

The amber resulting from this process is a mixture of clear resin and cell-sap and was certainly dim in its original condition. We shall also have an opportunity to see clear amber which owes its origin partly to other causes.

No. 3. Amber in the form of drops, from the size of a pea to that of a medium sized orange. In this form they once hung on the branches of the amber tree till they had so far hardened, that on falling they kept their original globular shape. No. 3.

Nos. 4—5 were still soft, and were pressed flat, frequently showing the impression caused by falling. No. 4—5.

The exuding resin was seldom able to round itself to a perfect globular shape; usually some hindrance presented itself which impaired the form.

No. 6. Conglomeration of several drops. No. 6.

No. 7. Pieces which flowed along branches etc. No. 7.

No. 8. Irregularly formed pieces in which one cannot trace the form of drops. No. 8.

No. 9. No. 9. Shows some pieces resembling lentils; these were secreted in cavities of the amber tree.

No. 10. No. 10. Amber showing the impression of the wood which once enclosed it, of leaves and larvae.

On exuding, the amber was dim, and this dimness was produced by the cell-sap distributing itself in minute bubbles through the clear resin. But the sun and general warmth soon dried up the mass: the little bubbles of cell-sap flowed together causing an increase in size; some kept rising to the surface of the still soft mass of resin, causing it to become clearer and finally quite clear. This process gave rise to the manifold varieties in the colour of amber which we distinguish as follows: Osseous (Knochig) — Mottled-osseous (Buntknochig) — Bastard — Flomig (oily-dim or misty amber) — Clear (Klar). In rare cases the cell-sap may have been coloured, and may thus have produced the extremely rare green and reddish brown hues. The dark blue colour in amber is caused by foreign matter and is produced by deposits of pyrites being present in the cavities and cracks of the resin.

No.11—19. Nos. 11—19. (*Exhibitors: Royal Amberworks and Prof. Dr. R. Klebs*). —

No. 11. No. 11. Knochiger Bernstein (Osseous amber). The minute bubbles have a diameter of 0,0008—0,004 mm and the sum of all bubble sections is equal to 0,40—0,52 % of the entire section.

No. 12. No. 12. Bastard. The bubbles have a diameter of 0,0025—0,012 mm and are equal to 0,25 % of the entire section.

No. 13. No. 13. Flomiger Bernstein (oily-dim or misty). This has bubbles of 0,02 mm in diameter and more, equal to 0,1 % of the entire section.

No. 14. No. 14. Klarer Bernstein (clear amber).

No. 15. No. 15. The so-called Blue Amber for the market (Blauer Bernstein) occupies a place between Flomig (misty) and Bastard.



By the commingling of two streams of resin, containing respectively a greater and a lesser admixture of cell-sap, and by unequal alterations having taken place in different zones of the same piece, we get the varieties known under the name of mottled or cloudy Bastard (Wolkiger Bastard) No. 16 and mottled-osseous Amber (Buntknochiger Bernstein) No. 17.

No. 16.

No. 17.

No. 18. Very rare colourings of amber in some cases **unique** such as: green, dark blue, brown and reddish.

No. 18.

No. 19. Amber with deposits of pyrites.

No. 19.

Besides this, we find a second sort of amber, which had been subjected to transformation before being deposited in the forest soil of that time. Under the glow of a tropical sun or perhaps the heat of forest fires engendered by lightning, the dim or in many cases already half clear amber was often melted again, then flowed down in thin liquid threads, scales and stalks, which the air quickly hardened at the surface, thus preventing the subsequent streams from solidifying with it into one mass. Thus arose another sort of amber, distinguished by its great clearness, somewhat higher specific gravity, and especially by its possessing a lesser degree of cohesion in the direction of its original course than at right angles to the same. The trade name of this sort of amber is „Schlauben“.

On account of their high liquidity combined with the circumstance, that they existed just where the sun called into being a multitude of minute denizens of the air, these streams of resin formed a trap for everything that chanced into their vicinity. The essential oil given off must have killed the microbes instantaneously so that there was hardly time for their attitude while alive to be altered by death. Once caught fast, they were drawn deeper and deeper into the liquid resin, and the next exudation covered them completely preserving them up to the present time.

Nos. 20—23. (*Exhibitors: Royal Amberworks and Professor Dr. R. Klebs.*) —



- No. 20. No. 20. Amber (Schlaube), which has exuded after the manner of stalactites. —
- No. 21. No. 21. Scaly formations overlapping each other, some of them curtain-wise.
- No. 22. No. 22. The partly little threads and drops of amber are interesting; when they had quite hardened they were enclosed by the next exudation and thus present a specimen of amber contained within amber.
- No. 23. No. 23. Sometimes it has happened that the threads of smelted resin united with threads of living resin i. e. with resin mingled with cell-sap. Such combinations show cloudy white and clear lines in the same piece — (Knochige Schrauben).

One attribute of amber is the gradual transformation of its surface. On a freshly cut surface this transformation would in the course of a few decades, show itself in a darkening of colour, while in a lengthened period of time a patina would be imparted to wrought amber which would greatly enhance its beauty. This deepening of colour in amber is caused by a shrinking process which had its begin ages ago, when the amber was bedded in the soil of the virgin forest.

Nos. 24—25. (*Exhibitors: Royal Amberworks and Professor Dr. R. Klebs, Königsberg.*) A number of pieces of amber in which the appearance of shrinkage is distinctly visible.

- No. 24. No. 24. Deeply marked shrinkage lines in osseous Amber.
- No. 25. No. 25. Deeply marked shrinkage lines in dim Amber.

Whenever the amber was completely hardened the shrinkage ceased. On the other hand its surface was weathered according to the proportion of air and moisture contained in the soil in which it was embedded. Thus we find a very thin crust on amber lying in or under subsoil water, and a very thick one when on a higher level; this is shown in the specimens of this collection.

## II. Deposits and distribution of Amber.

It is impossible to set up definitive statistics as to the duration of the period in which *Pinites succinifer* Göp. produced amber on the land in the region, which is now the Baltic Sea: science cannot decide whether it was thousands, or hundreds of thousands of years.

Towards the close of the period when amber was being deposited, the varying oscillations of the surface of the earth caused the afore-mentioned Eocene region to sink gradually while other solid parts were at the same time raised out of the sea. By this sinking, and the consequent washing away by the water, the resinous soil was brought within the action of the surf. The amber and its surrounding soil were washed away, the former happily being deposited close by, while what remained of the tree trunks was carried away into the open sea.

The deposits of this time consisting of amber and the detritus of that sunken land together with the remains of certain marine animals and whose remains have been preserved, formed a new deposit called Blue Earth (Blaue Erde) on account of its blue colour or because of the Glaukonit or „Glaukonitic Sand“ found in it.

In geological parlance Blaue Erde is called Unteroligocaen. This stratum, the chief region of which is in the northwest corner of Samland may be reckoned as the home of amber as far as we are concerned. From this stratum it passed to various later strata, and this stratum of Blaue Erde is the seat of the mining operations of the Royal amberworks at Palmnicken.

The Lower Oligocene (Unteroligocaen) period passed away in its turn. The continents gradually acquired their present outlines, and at the place where blaue Erde (Blue Earth) had been deposited, there had been alternately land and water. The land of that age also was clothed by a luxuriant forest, but its characteristic trees were no longer



Pinites, Tuja and oaks, but *Taxus*, poplars and other species which point to a much warmer climate than the present one. The débris of the vegetation of that time yielded the material for the formation of the deposit of brown coal. At this time, called by the geologist the Miocän period the amber yielding tree had not quite died out, and a few late examples supplied sufficient amber, as found for instance in the Striped Sands (Gestreiften Sanden), to make the mining of it a lucrative industry in the time of Frederick the Great.

A gradual change again came over the face of the earth. Several factors combined to cause a very cold climate to prevail in the northern parts of Germany. The Alps had been raised to a much greater altitude than they have at present, thereby deflecting the warm airs from the equatorial regions which had thawed the glaciers; the joining of France and England of which we have scientific proof, turned away from the North Sea and Baltic regions that source of warmth, the Gulf Stream, which could then promote the development of a luxuriant flora at Spitzbergen. It is also possible that the effects of the distance of the sun may have had considerable influence on the climatic conditions of the temperate zones: be that as it may, the fact remains that a mighty glacier extended from the northern mountains and covered with its icy shroud the whole northern part of Europe, Russia and America. These masses of ice, pushing and pressing, bore slowly but surely, like gigantic ploughs, through the lower strata, carrying with them, and mixing up into what is called a Ground Moraine, every thing that could not withstand them. Thus we find in this Ground Moraine, not only débris of the oldest crystalline formations, but specimens of all the rocks which the glacier encountered on its way. Even hard rocks like granite and gneiss could not resist the impact, and fragments of them are scattered about as erratic boulders wherever a former



moraine exists. It is natural, that a comparatively soft stratum like the Blue Earth (Blaue Erde) was easily pushed onwards and absorbed into the ground moraine. In this way amber is distributed over the whole of the North German flats, so that at the present day it is to be found, though only erratically in the marls, clays, and sands of the whole of North Germany. The Glacial Period (Diluvium) also passed away.

Our land was freed from its icy armour, the masses of ice thawed, the released waters formed our river beds and valleys, collected together in the hollows which had no outlet, and in this way also the Baltic Sea was formed. And here we reach a period in the history of our globe which we call the Alluvial Period (Alluvium).

The North of Europe had practically assumed its present form. Water, wind, (downs) vegetation (turf) and animal life combined to form deposits such as continue to be formed now before our own eyes.

By the fretting of the waves on the shore cliffs of the Baltic, a quantity of amber has been loosened and carried to sea, has been collected in the sea bed, whence it is thrown out as so-called „beach-gold“ after every violent storm which blows in the direction of the coast.

Considering the enormous pressure of the glacier on the underlying earth, it may be counted a happy chance that the Blue Earth and the superimposed Tertiary system were able to resist the impact, similarly so with the Nunataes in Greenland.

The only known spot at which this is the case, is a part of the northwest corner of Samland.

Nrs. 26—38. (*Exhibitors: Royal Amberworks and Professor Dr. R. Klebs, Königsberg.*)

No. 26. A piece of amber bearing Blue Earth No. 26.  
from the amber mine Palmnicken.

No. 27. Amber out of Blue Earth. No. 27.

No. 28. Sharks teeth out of Blue Earth. No. 28.

- No. 29.           No. 29. Crayfish, (*Coeloma baltica* Schl.) from  
the Blue Earth of Kraxtepellen.
- No. 30.           No. 30. Lobster, (*Hoplopatria Klebsii*, Noetl).
- No. 31.           No. 31. Amber from the Krant of Grosskuhren.
- No. 32.           No. 32. *Ostrea ventilabrum*. Grosskuhren.
- No. 33.           No. 33. Amber from the Striped Sands (gestreiften Sanden).
- No. 34.           No. 34. Miocene Flora from the Samland Tertiaries at Rauschen.
- No. 35.           No. 35. Amber from the Miocene Striped Sands (Miocänen gestreiften Sanden) at Palmnicken.
- No. 36.           No. 36. Amber from Diluvial deposits.
- No. 37.           No. 37. Amber from the Alluvial sands of the Baltic.
- No. 38.           No. 38. Amber from turf.

### III. Other resins of plants of the tertiary formation.

Whenever we come across the fossil resin of amber in *Pinites succinifer* Goep. predominant in the woods of that period, we also find, though rarely, the deposits of other trees of the tertiary formation. The resin of *Pinites stroboides* is oftenest to be found. Like amber it is brought to the market, but it has a somewhat lower point of fusion, is more brittle than amber, shows a brighter gloss on fracture and contains less succinic acid. This resin has of late been separated from the amber by science and has been called „Gedanit“. The workmen call it „brittle amber“. — A milky resin of a yet unknown fossil plant is the „Glessit“, Unknown as well are the original plants of „Stantinit“ and „Beckerit“. The latter appears to me to be a fossil sap of a plant not unlike the *Guttapercha*. It may be mentioned that sometimes, though very rarely, some remains of wood of the East Prussian tertiary formation have become Jet; this Jet although inferior to the English one, can be worked. It is according to microscopic examination the wood of a Cypress-tree.

Nos. 39—45. (*Exhibitor: Professor Dr. Klebs.*)



No. 39.	Bright Gedanite.	No. 39.
No. 40.	Dim varieties of Gedanites.	No. 40.
No. 41.	Osseous Gedanite. — Blue Earth Palmnicken.	No. 41.
No. 42.	<b>Unique specimen.</b> Glessit, Blue Earth Kraxtepellen.	No. 42.
No. 43.	Stantinit. — Blue Earth Palmnicken.	No. 43.
No. 44.	Beckerit. — Blue Earth Palmnicken.	No. 44.
No. 45.	Jet from the Blue Earth Palmnicken.	No. 45.

The fact that the plants of the tertiary period in Samland have left undecomposed resinous substances strenghtens the supposition that the conifers of early periods have not disappeared without leaving traces in other localities. Fossil resinous substances are therefore frequently found not only in peat woods but lying loose in the ground. These have been called by the collective name: "Retinite". The absence of amber acid distinguishes them from amber. They are of very slight industrial value, as they lie very scattered. A fossil resin which is said to abound in Canada, on the shores of the Cedar lake is the only known exception. I have examined this resin very carefully, have compared it with other fossil resins and given it the name: "Cedarite". It is generally found in grains ranging in size from a pea to a nut; it is not amber, being harder and less fusible.

Nos. 46—50. (*Exhibitor: Professor Dr. R. Klebs, Königsberg.*) A collection of fossil resins, partly curiosities (Unica).

No. 46.	Simentit from Catania. Sicily.	No. 46.
No. 47.	Rumenit. Roumania.	No. 47.
No. 48.	Walchowit.	No. 48.
No. 49.	Retinit. Partly <b>unique spec.</b>	No. 49.
No. 50.	Cedarit.	No. 50.

#### IV. Objects enclosed in amber.

Every palaeontologist will certainly be delighted to find substances in amber, which show the most delicate plants



and the smallest animals in such a condition, that they can be studied and examined in detail just like living specimens. There are to be found in amber all classes of insects, moreover spiders, scolopendrias, crustacees, worms even gastropones, feathers of birds and hairs of mammalias. There are at the same time in amber a great many leaves, blossoms and fruits.

**No.51-118** Show a quantity of objects enclosed in amber.  
(*Exhibitor: Professor Dr. R. Klebs, Königsberg.*)

They are polished into a small form, so as to render the objects as clear as possible.

It would be very nice to preserve precious samples of that kind, but unfortunately amber gets darker and darker in the course of years. This process not only affects the surface of the pieces, but takes place also in slight fractures in the interior of the objects and thereby destroys them. Precious originals of some museums have in time lost their value. Already nature shows us, in the state of preservation of pieces in water, compared with those in loose soil, that it is merely the keeping off of air which preserves the amber for everlasting. Starting with this fact I bed precious inclusions in a mixture of resin with the same exponent of refraction of light as exists in amber, shutting it up with a plate of glass. Hereby amber and its inclusions are protected from getting dim, rendering them more visible for an examination and more fit for museum-purposes. The table of the flora and fauna of the amber has been arranged according to the following method.

**Plants.**

No. 51 Lichenes.

a) *Cetraria* sp. n.

No. 52 Hepaticae.

a) *Radula oblonga* Casp.

b) *Frulania primigenia*.

c) *Iungermania dimorpha*  
Casp.

*Diversa Iungermaniaceae.*

No. 53 Coniferen.

a) *Pinus cembraefolia* Casp.

**Splendid spec.**

b) *Pinus wredeana* Casp.

**Splendid spec.**

c) *Pinus* sp. n. Blossom  
masc. **Uniquespec.**

- d) *Glyptostrobus europaeus* Brong. Char. ref. Casp.
- e) *Widringtonites oblongifolius* var. *longifolia* Casp. **Unique.**
- f) *Sciodopitites* sp.
- g) *Chamaecyparis Casparyii* R. Klebs, **Splendid spec.**
- h) *Chamaecyparis Casparyii* R. Klebs.
- i) *Libocedrus subdecurrens* Casp.
- k) *Chamaecyparis massiliensis* Sap. char. ref. Casp.
- l) *Thuites borealis* Casp. et R. Kl.
- m) *Thuites borealis* Casp. et R. Kl.  
Diversa. Leaves; Scales
- n) *Conifera* sp. n. Bough. **Unique spec.**  
*Conifera* sp. n. Bough. **Splendid spec.**
- Dicotyledonen.
- No. 54 *Cupuliferen.*
- a) *Quercus longistamina* Casp. **Splendid spec.**
- b) *Quercus* sp. n. Blossom. **Unique spec.**
- c) *Quercus* sp. n. Blossom. **Unique spec.**

- No. 55 *Myrsinaceae.*  
*Myrsinopsis succinea* Conv.
- No. 56 *Aquifoliaceae.*  
*Ilex multiloba* Casp. **Unique. Splendid spec.**
- No. 57 *Ericaceae.*  
*Clethra Berendtii* lon.
- No. 58 *Diversa.*  
a) Spec. nov. Blossom. **Splendid spec.**  
b) Spec. nov. 3 Blossoms. **Splendid spec.**
- No. 59 *Lauraceae.*  
*Laurus* sp. n. Leaf. **Splendid spec.**
- No. 60 *Diversa.*  
a) Spec. nov. Leaf. **Unique spec.**  
b) Spec. nov. Leaf. **Unique spec.**

### Animals.

- I. *Coleoptera.*  
Most species of beetles have also been observed, oftenest the *Elateiridae.*
- No. 61 *Carabidae.*  
*Carabidae* sp. nov.
- No. 62 *Elateridae.*  
Spec. nov. *Elateridae.*
- No. 63 *Eucnemidae.*  
Spec. nov. *Eucnemida.*
- No. 64 *Cerambicidae.*  
Diversa spec. *Cerambicidae.*



- No. 65 Lymexilonidae.  
Lymexilon sp. nov. **Splendid spec.**
- No. 66 Paussidae.  
Pausus spec. nov. **Splendid spec.**
- No. 67 Malacodermata.  
Spec. nov. **Splendid spec.**
- No. 68 Cyphonidae.  
Sec. nov. Div. specim.
- No. 69 Anobidae.  
Spec. nov.
- No. 70 Buprestidae.  
Spec. nov. **Splendid spec.**
- No. 71 Melandryidae.  
Spec. nov. **Splendid spec.**
- No. 72 Mordellidae.  
Spec. nov.
- No. 73 Claeridae.  
Spec. nov.
- No. 74 Cucujidae.  
Spec. nov. **Splendid spec.**
- No. 75 Coccionellidae.  
Spec. nov. **Splendid spec.**
- No. 76 Diversa.  
a) Spec. nov. **Splendid spec.**  
b) Spec. nov. **Splendid spec.**  
c) Divers. Coleoptera.

## II. Hymenoptera.

All species belonging to this group have been observed with the exception of the Braconidae and Evaniadae. By far the commonest are the ants.

- No. 77 Vespidae.  
a) Sp. nov. **Splendid spec.**  
b) Divers. Vespidae.
- No. 78 Apidae.  
a) Bombus sp. n.  
b) Apis sp. n. **Splendid spec.**
- No. 79 Formicidae.  
Divers. Formicae, Myrmicae, Pouteridae.
- No. 80 Diversa.  
Divers. sp. nov. Hymenoptera.

## III. Neuroptera.

The number of species of the Neuroptera in amber is enormous. Living species also have their representatives in amber. By far the oftenest are the Phryganidae. In about 800 Phryganidae there is but one representative of the other three families.

- No. 81 Panorpidae.  
a) Panorpa spec. n. **Unique.**  
b) Bittacus spec. n. **Splendid spec.**

- c) Divers. spec. Bittacus.
- d) Rhaphidia **Unique.**  
**Splendid spec.**

No. 82 Phryganidea.

- a) Oligotricha **Splendid spec.**
- b) Diversa spec. Phoyganidea.

IV. Orthoptera.

The representatives of the class of the Orthoptera are down to the Campodidae and Acrididae all living species in amber. Oftenest are the Podanidae.

No. 83 Thysanura.

- a) Lepismida **Splendid spec.**
- b) Lepismida.
- c) Nov. spec. **Unique.**
- d) Petrobius n. spec.  
**Splendid spec.**
- e) Diversa Thysanura.

No. 84 Forficulidae.

- a) Forficula sp. n. **Splendid spec.**
- b) Forficula sp. n.

No. 85 Blattidae.

- a) Blatta sp. nov. **Splendid spec.**
- b) Blatta sp. nov. **Splendid spec.**
- c) Blatta sp. nov. **Splendid spec.**

- d) Blatta sp. nov. **Splendid spec.**

- e) Blatta sp. nov. **Splendid spec.**

- f) Blatta sp. nov. **Unique.**  
**Splendid spec.**

- g) Blatta sp. nov. **Splendid spec.**

- h) Blatta sp. nov. **Splendid spec.**

- i) Diversa Blattina spec.

- k) Diversa Blattina spec.  
Larvae.

No. 86 Phasmidae.

- Phasma spec. nov. **Splendid spec.**

No. 87 Pseudoperlidae.

- a) Pseudoperla sp. nov.  
**Unique. Splendid spec.**

- b) Pseudoperla sp. nov.

- c) Pseudoperla sp. nov.

- d) Slough of a larva.  
**Unique. Splendid spec.**

- e) Pseudoperla sp. nov.  
**Splendid spec.**

No. 88 Grillidae.

- a) Grillidae spec. nov.  
**Splendid spec.**

- b) Divers. Grillidae.

V. Pseudoneuroptera.

The living species of the class of the Pseudoneuroptera are also to be found fossil.



Although all of them are to be found relatively seldom in amber, a considerable number of species, especially of Termites and Ephemera are well known.

No. 89 Psocidae.

- a) *Psocus offinis* H.
- b) *Diversa* spec. nov.  
Psocidae.

No. 90 Ephemeridae.

- a) *Ephemerida* sp. n.  
**Splendid spec.**
- b) *Ephemerida* sp. n.  
**Splendid spec.**
- c) *Ephemerida* sp. n.  
**Splendid spec.**
- d) *Ephemerida* sp. n.

No. 91 Perlaridae.

- a, b) Perlaridae.

No. 92 Termitidae.

- a, b) *Termes baltica* B.  
**Splendid spec.**
- c) *Termes baltica* B.
- d) *Termes gracilis* B.
- e) *Diversa* spec. Termitidae.

#### VI. Lepidoptera.

With the exception of one species of a Macrolepidoptera all of amber belonging to this group are Microlepidoptera, which are to be found in large numbers of different kinds and species.

No. 93. Microlepidoptera.

- a) u. b) Microlepidoptera.

#### VII. Diptera.

Enormous is the number and variety of kinds and species found in the class of the Diptera in amber. In this present exhibition only the rarest and best preserved kinds especially of the Diptera have been exhibited.

No. 94 Chironomidae (Meunier).

- a) Spec. nov. **Splendid spec.**
- b) Spec. nov. **Splendid spec.**

No. 95 Sciarinae (Meunier).

- a) Spec. nov. **Splendid spec.**
- b) Spec. nov. **Splendid spec.**

- c) 4 *Diversa* spec. nov. Sciarinae.

No. 96 Psychodidae (Meunier).

- a) Spec. nov. **Splendid spec.**

- b) 2 *Diversa* spec. nov. Psychoda.

No. 97 Mycetophilidae (Meunier).

- 3 *Diversa* spec. nov. Mycetophilidae.

No. 98 Tipulidae

Diversa spec. nov. Tipulidae.

No. 99 Diversa.

Diversa spec. nov. Nematocera.

No. 100 Leptidae.

a) Spec. nov. **Splendid spec.**

b) 3 Spec. nov. Leptidae.

No. 101 Dolichopodae (Meunier).

a) Spec. nov. **Splendid spec.**

b) Spec. nov. **Splendid spec.**

c) 2 Diversa spec. Dolichopodae.

No. 102 Empidae (Meunier).

3 Diversa spec. Empidae.

No. 103 Phoridae.

3 Diversa spec. Phoridae.

No. 104 Silvius longicornis Löw (Meunier) **Splendid spec. Original.**

No. 105 Diversa.

Diversa spec. nov. Brochycera.

No. 106 Aphaniptera (fleas).

Flea. **Splendid spec.**

**Unique** for the genus and species.

Typhlopsylla.

#### VIII. Rhynchota.

With the exception of

the Parasitica all living species have been observed. The number of species is very great and the shapes partly very peculiar.

No. 106 Homoptera and Aphidae.

a) Spec. nov. **Splendid spec.**

b) Spec. nov. **Splendid spec.**

c) Diversa sp. n. Cicadidae.

d) Spec. Aphidae.

No. 107 Hemiptera.

Spec. nov. **Splendid spec.**

#### IX. Myriopoda.

The Myriopodes belong to the rarest samples except Polyxenus, yet both Chilopoda and Chilognata have been observed in several species.

No. 108 Lithobidae.

a) u. b) Lithobius spec. **Splendid spec.**

c) Diversa spec. nov. Lithobidae.

No. 109 Scolopendridae.

Scolopendra sp.

No. 110 Julidae.

Julus sp.

#### X. Arachnoidea.

Spiders are very often found in amber; well preserved specimens however,



whose eyes and all other parts are to be seen distinctly, are rare.

Oftenest the mites occur, yet the examination of the raw stone is almost impossible on account of their being so small. Numerous are the Araneidea a little rarer the Phalangiida and Pseudoscorpionidae.

True scorpions are represented only by one specimen, Pedipalpi and Solifugae, still wanting.

No. 111 Acarina.

Diversa spec. nov. Acarina.

No. 112 Araneida.

a) 3 Spec. nov. **Splendid spec.**

b) Diversa spec. nov. Araneida.

No. 113 Phalangidea.

Spec. nov. **Splendid spec.**

No. 114 Pseudoscorpionidae.

2 Spec. **Splendid spec.**

No. 115 Acarina.

3 Spec. Acarina.

#### XI. Vermes.

No. 116 2 Spec. nov. Vermes.

#### XII. Diversa.

No. 117 Water inclosed in clear amber. **Unique. Splendid spec.**

No. 118 Water and pyrites inclosed in dim amber. **Unique. Splendid spec.**

### V. Amber trade and industry up till 1872.

Amber as we have seen gives us information as to its origin, the forces that distributed it into its various deposits, the life and aspects in the virgin forest of a period in the history of the earth, which is so remote as to be computed by millions of years: not only so, but it furnishes us with an important document concerning the history of man. Numerous specimens of wrought amber belonging to all stages of civilisation have been preserved up to the present day and tell us much of the intercourse of various human races in times of which no other records exist.

The fact of the discovery of its existence there led in a certain sence to the figurative discovery of the shores of the Baltic, at least to systematic geographical knowledge

regarding it, so that as Alexander von Humboldt aptly remarked, amber may be regarded as the father of German commerce in its wider significance. We owe it to amber that the torch of civilisation was borne into old Prussia from the regions of the Black Sea and the Mediterranean at a much earlier period than would have been the case, had it taken the slow and interrupted course of land traffic from south to north.

The trade routes of olden times are clearly distinguished by tracing the objects of barter in bronze, silver etc. which were brought by the merchants from the more civilised countries to exchange with the simple folks of the north for amber.

These foreign works of art were held in reverence by their new owners and were frequently placed in their tombs.

It is the work of archaeologists to examine and elucidate the mysteries of these tombs, to subject what they found in them to a critical interpretation and an exhaustive comparison with written records; and this enlightening work has already been carried up to a point of time 2000 years before our own era.

In the Old Testament there is occasional mention of stones which must be assumed to be amber. Assyric cuneiforms record the fishing for amber; but not till the fifteenth century before Christ does the amber found speak for itself, and it is at this point that exact research begins. We find that from the south of France, east-wards, all the races as far as the Black Sea were engaged in the amber trade, either directly or indirectly. They carried it on simultaneously till one supplanted the other, and at last all were supplanted in turn by the Romans.

The first traders in amber were naturally the Phoenicians — the commercial race par excellence of antiquity. They bought the amber from their middlemen the Ligurians on the Gulf of Genoa.



Their commercial pre-eminence and their close connection with jews (I need only refer to the commercial treaty between their king Hiram and king Salomon in 990 B. C.) make it probable that they were the first to make amber known to the races round the Mediterranean.

The "dumping grounds" of the Phoenicians were the south easterly countries of the Mediterranean and their Hinterlands, as Egypt, Syria, India, Asia minor, and in remotest times Greece also. The amber beads, of which Schliemann found in Mykene about 400 in two tombs, and in Baccone near Ancona more than a bushel as large as pigeon's eggs, were brought there in every probability by the Phoenicians.

After the Ligurians, the inhabitants of Massilia (the Marseilles of today, founded in the sixth century B. C.) rapidly raised their city to great importance as a commercial centre. Massilia even equipped and sent out an independent expedition under Pytheas to the shores of the Baltic to procure amber.

One can hardly maintain that Pytheas was the first to undertake a sea voyage to the ambergrounds, but it is certain that over-sea commerce was extremely limited at that time.

Amber was generally supplied by the overland route. This was the famous ancient trade road, passing through the valleys of the Rhone and the Rhine, on which the Ligurians and the Etruscans as well as the Massilians traded.

Considering the inconsiderable quantities in which Amber was found in the North Sea on the coast of Jutland, this trade cannot have been very great, especially as the Massilians had to share it with other races. When about 500 B. C. the Etruscans were successful in discovering the rich deposits of amber at the Baltic Sea, and thus placed it on the market in great quantities at a low figure, it is probable that about 400 B. C. the Massilians gave up entirely their independent importation of amber,

and contented themselves with what the Etruscans supplied them with to retail.

The retail market of the Massilians was chiefly Southern Switzerland, as we may judge by the great quantity of Massilian coins we find in Graubünden, Tessin, Wallis, Genf and Bern.

The Etruscans had the most active trade in amber. Fifteen hundred years B. C. they had great maritime power, were highly cultivated and could work bronze and other metals in an artistic manner. It is therefore to be assumed that they were also engaged in the amber trade on a large scale.

It was not until the sixth century when their maritime power had been broken, and one after another of their colonies had been taken from them, that they were forced to turn their attention to the development of their inland trade. This had been already very active in the fourth century, as it proved by the many objects of Etruscan art and industry of this period which have been found, more especially in Switzerland, Tyrol and the Bavarian Palatinate. The more the Romans encroached on Etruscan territories in the South, the more these enlarged their trade in the north. The north was flooded with Etruscan art wares, but of a rough kind, suitable to a barbarous taste.

About 150 B. C. the Roman power had advanced so far as to entirely put an end to Etruscan trade.

The Ligurians inhabited the country between Massilia and Etruria. We have no reliable records about their amber trade; but the fact, that at that time amber was called "Ligurious" indicates, that the trade was so considerable, as to give to this favourite stone the name of the place it was known to come from, viz Liguria.

The name Ligurios was still in use in Pliny's time, although the origin of the word had been long forgotten, and it was endowed with the phantastic meaning "the urine of the lynx," from which amber was thought to have its



origin. Besides the races already mentioned, the Pannonians, the Venetians and above all the Greeks of the Thrac. Chersones took part in the amber trade.

The last mentioned brought their objects of barter as far as the vicinity of Königsberg. The Greeks of Pontus also came as far as East Prussia and carried on trade in the Ortelsburg district as is proved by objects found there.

The year 150 B. C. saw the commencement of the complete decline of the amber trade.

The Roman Empire thought of nothing but the policy of conquest and the extension of their territory and neglected all adornment and luxury. At first the Romans may have imported small quantities of amber from the Etruscans, but when this source dried up, amber fell into complete oblivion. On the other hand it may be said to have been re-discovered at the beginning of our era, and took its place in trade under the name of Electrum. Now indeed, the Romans became effeminate and given over to luxury, made haste to procure this new means of adornment. It became fashionable and was highly prized under the name of Succinum. With the increase of luxurious living, the value and the use of amber increased enormously, it being employed in the fabrication of an infinite variety of objects, such as breast-pins, buttons, nicknacks, carvings, goblets etc.

By chance Pompey found a great quantity of amber on an Assyrian privateer which he had captured, and learning that it was procured among the white shore cliffs of the northern seas, he reported this to Nero in Rome, who was so much pleased at the news, that he equipped a special military expedition, and sent it to the north to procure amber. So this expedition both Pliny and Tacitus owe their knowledge of the Teutons.

Once in direct intercourse with all powerful Rome, East Prussia was simply delighted with art objects of Ro-

man manufacture, and thousands of such things found in East Prussian tombs in the first, second and third centuries A. C., and innumerable pieces of amber found in Italy give abundant evidence of the extent of commercial intercourse.

With the incursions of the Teutons into the mighty Roman Empire, the decline of the amber trade set in, and this is again reflected in the diminishing presence of objects of Roman origin in the tombs of the amber country.

In the early Middle ages the trade was still inconsiderable, though in the sixth century A. C. Theodoric, the renowned East Gothic king wrote a letter to the Aestiers, thanking them for the amber sent to him, and amber beads have been found in tombs in South Germany dating from the seventh and eighth centuries, while articles of Byzantine and Arabian silver workmanship, and other objects of diverse origin have been found in East Prussia. In an age when metals were not yet known and shipped flints served as weapons and domestic utensils there was already a considerable working in amber ornaments in East Prussia. We can assume this to have been about 1000 B. C. These ornaments are to be found, not only as funeral offerings, but also to a still greater extent in the bed of the Kurische Haff (Baltic) at a depth of from 15 to 30 feet. So judged by various signs these latter finding places would seem to have been ancient pile buildings.

Among these amber manufactures of the Stone-age the various beads, charms (-Anhängsel) buttons etc. are very interesting.

Nos. 119—122. [*Exhibitor Prof. Dr. R. Klebs*] show wrought ambers of different periods of ancient civilisation.

No. 119. Wrought amber of the Stone-age, from No. 119. the bed of the Kurische Haff at Schwarzort.

No. 120. Wrought amber of the Stone-age No. 120. found near the shore of Pomerania.

No. 121. Amber beads from a tomb of the La- No. 121. Tène period six hundred years before Christ in juxta-



position with the other offerings, a sword and armlets of bronze from Gross Dirschkeim in Samland.

**No. 122.** No. 122. Amber beads of the period of the tumuli 600 B. C.

The first definite records of the amber industry in the middle ages are of the fourteenth century. There was a guild of amber turners in Bruges which was followed by a similar in Lübeck. Their work was limited to the making of rosaries; hence their name of paternoster makers.

In 1399 there was in Königsberg a very skilful amber cutter, who worked for the Grand Master making artistic reliefs for altar etc. which were composed of precious metals and encrusted with gems.

In the sixteenth century the amber industry had spread and assumed great dimensions. Königsberg especially produced a great variety of artistic wares in amber.

All the great works of art, of which there are splendid specimens in almost every museum, are of the 17th. or 18th. centuries. The imperial collections in St. Petersburg and Moscow, the Grüne Gewölbe (Green Vault) in Dresden, and the collection in Berlin possess real gems of art in amber work.

Very celebrated is the amber chamber — a remarkable and original attraction of the imperial palace at Zarskoje-Sselo, the filling up of which is composed of gifts of Frederick William I. to Peter the Great and of Frederick the Great to Catharine. Amber was generally very much employed for royal gifts to friendly Courts and their Embassies. At the beginning of the 19th. century the amber industry declined but improved again gradually from 1872 onwards: to day it is still going on improving.

## **VI. Development and administration of the „Regal“ (Royal Prerogative).**

So far as we can learn from historical records amber seems to have been in early times the absolute property

of the finder. Later on the Dukes of Pomerellia claimed the amber for themselves as far as to the confines of Danzig.

But when the „Ritterorden“ (Order of Knights) took possession of Prussia in the 13th. century, not only did it take over the monopoly of the Dukes of Pomerellia, but it extended this monopoly over the entire line from West to East Prussia. From this time on the German Ritterorden (Order of Knights) was the rightful owner of every piece of amber found, and any finder was obliged to give it up to the knights for a small settled recompense. This law is still practically in force, and all the changes in the production and sale of amber during the last eight hundred years have been effected by this law, with the usual result: dissension between producer and buyer. On the one hand the continual striving to turn the prerogative into a direct monopoly in order to keep the quotation of price in their own hands, and then to rule the market, on the other hand the efforts of the manufacturers to break through the monopoly so as to procure their raw amber as cheaply as possible. Side by side with this, the earnest endeavours of the government of the country to do away with abuses and to do justice to both sides.

After having parted with their amber fishing rights on the coast of Samland to the Bishop of Samland in 1257, and those on the coast of Danzig to the Danzig fishermen in 1312 and to the monastery of Oliva in 1340, the Knights attempted annually the contracts they had made and to get the monopoly back into their own hands. Not until after many unsuccessful attempts did they succeed in overcoming all the difficulties in the way, in the middle of the fifteenth century. When in 1466, by the place of Thorn, a large portion of territory was alienated from the order, these alienated lands obtained a license by Polish law, to extract amber to their own ground, a right which West Prussia succeeded in obtaining also on the partition of Poland 1773, which right was thus lost to the Erm-



land only. Accordingly our inland amber monopoly Pomeranien is limited to East Prussia, and the diocese of Pomesanien, while in other inland places the right of amber mining rests with the owner of the soil. It is otherwise with the right of collecting amber by the seashore; on the shores of Jutland, Schleswig, Mecklenburg, Rügen und Neuvorpommern amber is the property of the owner of the shore. Along the shore from the mouth of the Weichsel to Polsk near Danzig, amber is the property of the city of Danzig. In all other parts of the Baltic coast of West or East Prussia, as well as in the Pomeranian districts Neu-Stettin, Dramburg, Belgard and Bütow amber belongs to the State, it is a „Regal“ (Royal prerogative.)

The Ritterorden (Order of Knights) exercised the prerogative over the lands which remained to it in 1466 with the greatest rigour. Any suppression of amber was punished by hanging on the nearest tree; so that all the communities along the shore groaned under this severity. The Order conducted the sale of the amber they produced in an eminently business-like manner. They erected in Bruges, Lübeck, Augsburg and Venice great warehouses for assorted stocks of amber and promoted the formation of guilds of amberturners. In its own country however, the Order prevented the establishment of any independent amber works, for fear that this might facilitate the smuggling of amber. Even at that time there was such severe friction between the guilds and the Order that the Hansa League and the Duke of Burgundy had often to mediate between the producers and buyers.

In course of time the order found the sale of raw amber too troublesome, and decided, at the beginning of the 16<sup>th</sup> century to place the whole of this trade into the hands of an agent, to farm it out in fact. But there were so many complaints against these agents, that in 1524 the parliament in Nürnberg was obliged to interfere.

In spite of this there was no actual improvement. Not till Duke Albrecht farmed the entire raw amber trade to a Danzig company did the buyers seem to be satisfied; but not those who had farmed it out, for we find that the successors of Duke Albrecht endeavoured for a whole century, and in vain, to annul the contract. The Great Elector however succeeded in getting the amber „regal“ back into his own hands, by payment of a large sum in compromise.

He moderated the severity of the amber laws by making the punishment dependent on the quantity of amber stolen. Other regulations however had the effect of encouraging mutual denunciations to such an extent that family life was disintegrated and destroyed, and in consequence the coast villages became gradually demoralised and impoverished.

The exercise of this „regal“ remained under the management of the state itself until 1811, when, the returns having diminished steadily since the beginning of the 19th century, the government decided to again place the raw amber trade in the hands of a chief agent (Douglas).

But this arrangement also gave rise to so many complaints and petitions to the government on the part of the buyers, that the former decided to accede to them.

The year 1837 was a turning point in the history of the amber trade. The state farmed out the mining of amber along the shore to the adjacent communities. In consequence the Samland shore villages began to prosper and rose from the most miserable condition to be flourishing communities. This prosperity went on increasing year by year, and the revenues of the state increased at the same time.

In the year 1860 the amber trade received a great impetus through the enterprise of the firm Stantien and Becker, to whose influence on amber mining I shall again refer. This firm went to work with such energy and perspicuity as to get the regal as a practical monopoly into their hands. However the complaints of the manufacturers against the



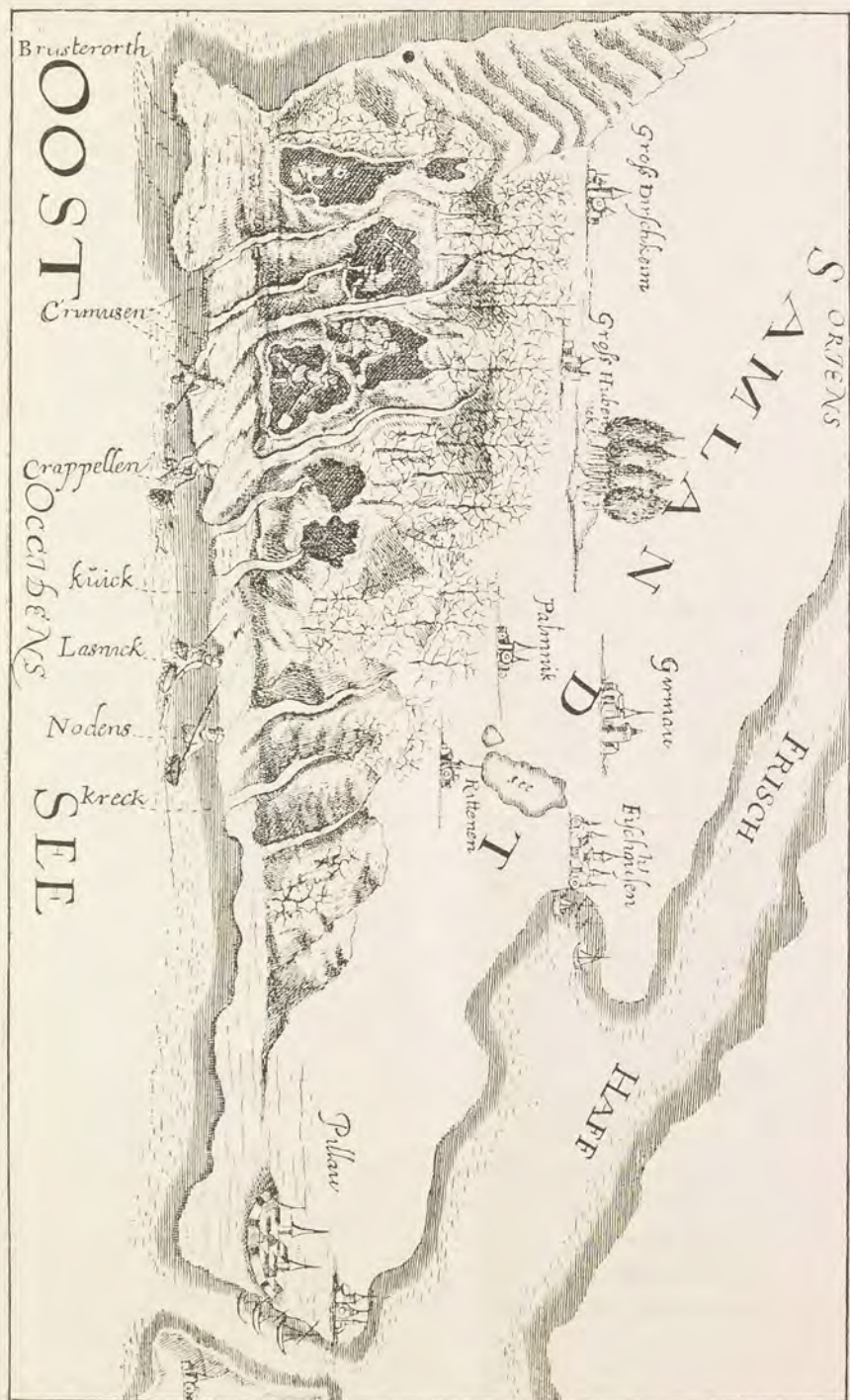
management of the firm Stantien and Becker became so urgent, that the state decided to purchase the whole stock in trade of the firm Stantien and Becker. Thus on april 1<sup>st</sup> 1899 the exercise of the regal passed again into the hands of the Prussian State.

### VII. The extraction of amber.

As the position of amber is various so is the manner of its extraction various. It is to be assumed that in ancient times only that amber was found, which was thrown up by the sea: but in Plinius' days it was known that amber could also be dug for in Liguria and Scythia. Not until 1585 do we have authentic records of the extraction of amber from the earth at Lochstädt, a fortress of the Ritterorden on the Frische Nehrung between Pillau and Königsberg.

The oldest picture of the home of amber and news about the digging for amber are given by Hartmann in 1677. In the same book there is a picture of fishermen with their nets, fishing for amber. Both these pictures are sufficiently interesting to be added to this guide on page 33 and 34.

In 1782 level mining in the high banks on the shore was resorted to: the digging followed the Striped Sands, but the out put was so poor, that this was soon given up. Not until the second half of the 19th century the mining of the original source of the amber, the Blue Earth was known. Then there were open workings established at several points on the Northern and Western shores. There were open cuttings from which the soil was removed when, at a depth of 90 feet or more, the Blue Earth was reached. Enormous masses of earth had to be removed, for it was necessary to clear away an extent of 10000 □ mt. of sand and clay, to reach through the funnel shaped narrowing cutting, an extent of only 2500 □ mt. of the Blue Earth. As the soil cleared away was always



Oldest map of the amber shore. Copy. Hartmann 1677.





Fishermen fishing for amber. Copy. Hartmann 1677.

thrown into the sea, to become a plaything of the waves, the government feared that the banks might be still more worn away than by the ordinary action of the surf, so it put a stop to these open cuttings.

While all these attempts were being made, the fishing for amber in the sea continued to yield the chief supply. When violent storms agitate the sea to a great depth, tear up and carry with it masses of sea-weed, it brings up amber at the same time, entangled in the sea-weed. As amber weighs spec. but little more, than sea water it is not dropped again into its old resting place, but is carried along with the crested wave. Thus it is, that after effective storms one sees the sea covered over a great extent with a meadow like surface of sea-weed and awaits with anxiety to see at what point the varied mass will be cast ashore. If the sea breeze turns to a land breeze at the right moment, there begins a violent struggle with the watery element. Even in the hardest winter the men dash into the surf, catching up the masses of sea-weed in hand nets and throwing it on to the shore, where their wives and children search through it for the precious treasure. The work must be quickly done, for in a moment the amber might slip away from the entangling sea-weed and begin to sink, when it would be carried back by the envious waves to its submarine bed. There have been storms in November after which the people of one district have gathered 30 000 Mk. worth of amber in a few hours. When the sea is smooth amber is taken by so-called "sticking". One sees from the boats when there is a piece of amber of any size caught between rocks and stones at the bottom, and one tries to get it up by means of peculiarly constructed hooks and nets.

All these methods of extracting amber were useless as soon as mining for it in the Blue Earth could be made to pay. It was the late Moritz Becker who struck out totally new methods of procuring amber. Instead of the



afore mentioned "sticking" he instituted diving, instead of cutting, mining; while in the depths of the sea he attacked the stores of amber with steam dredgers. It was he who founded the steam dredging station at Schwarzort, the diving station at Brüsterort and the mines at Palmnicken now carried on by the Prussian State. The open workings at Palmnicken extended rapidly by sections up to the neighbouring villages, Kraxteppelin und Hubnicken and are now carried on in the Annengrube (Annen-Mine). Great masses of Blue Earth are brought up from these workings, thoroughly washed by means of enormous volumes of water, which carry away the sand and clay through sieves and drains, and retain the amber. In 1902 for example there were

125076 cbm. of Blue Earth brought up containing  
406397 kgs of amber.

The amber procured in this way however is very much weathered on the outside, making it impossible for the manufacturers to test it as regards its colour, flaws and other peculiarities, and to fix the use it could best be put to. The amber which the waves in their constant motion have polished against the sharp sand, and which the heavy surf has pounded and split is very much preferred as an article of trade. Therefore means must be taken to impart the like good qualities to the mined amber. What is done by the waves on a large scale is copied at Palmnicken on a small scale. The amber taken from the Blue Earth is placed in great revolving barrels along with sand and water: these are kept in motion until the dark surface is removed and the amber has assumed a similar appearance to that taken out of the sea. So far prepared it is taken to the sortingrooms at Königsberg. Here the chisel of the workman takes the place of the surf and makes the cracks in the large pieces. Very considerable quantities of raw amber have been brought up at Palmnicken. In 1901 the whole out put was 406000 kgs, in 1902 =

406,397 kgs. In the last twenty years there have been 1716178 kgs of large pieces, 1920450 kgs of medium sized pieces, 4820212 kgs of small, altogether a total of 8456840 kgs of amber. The revenues which the Prussian State draws from the regal are correspondingly high. From 1803 to 1811 the amber industry had to receive a subsidy from the government; after that however the revenues amounted to

(1770 = 60000 M, 1780 = 53000 M, 1790 = 14000 M).

1810 =	1000 M	1865 =	41000 M
1820 =	45000 „	1870 =	199000 „
1825—60 p a.	34000 „	1871 =	230000 „
1873 =	252000 M	1892—1898 „	660000 M
1876 =	371000 „	1899 =	826817 „
1877 =	770000 „	1900 =	1019210 „
1880 =	556000 „	1901 =	1539273 „
1881 =	561000 „	1902 =	1599243 „
1882—1891			

on average p. a. 670000 „

In face of these high figures one cannot help asking oneself what has become of these enormous quantities of amber. In former times merchants went to the shore after a favourable storm and bought roughly, by heaps, the amber which had been brought in. This sort of trading was naturally calculated to induce extensive speculation. It was again the late Moritz Becker, head of the firm Stantien and Becker, who put an end to this speculation. When the brilliant idea of Moritz Becker placed amber mining in the Blue Earth on a paying footing, he suddenly flooded the market with such enormous quantities of amber, that it was thought impossible to get rid of it.

Becker therefore introduced a system of exact assortment of raw amber, in order to allow all branches of the industry to buy only that sort of amber which was suitable to their own trade. Thus every manufacturer had the advantage of being able to concentrate his whole buying



power on the sorts suitable to his own use, where as formerly he was forced to buy along with that other sorts which he could not use for himself, but had to re-sell as it was. This sorting system of Becker's still prevails in the amber trade of to-day, and has been retained and extended under the state management.

The subdivisions of raw amber for trade purposes fall under three heads, pieces suitable for the manufacture of articles connected with smoking, pieces which can be used for beads and other ornaments, and pieces which on account of their small size can only be used to make varnish. The pieces of amber from which mouth-pieces for cigars, cigarettes, and tips for mouth-pieces and pipes are made are called *Fliesen* and *Platten*. The former are the thicker, the latter the thinner pieces. In the manufacture of ornaments and beads, *Grundstein* and *Bodenstein*, *Rund* and *Knibbel* are used. To make the lacquer the various *Firniss* sorts are used. Within these chief groups there are about 150 trade sorts, which are distinguished partly by their size, and partly by the colouring and purity of the amber. According to the number of pieces to a Kilogram, the *Fliesen* are divided into about twenty sorts. In *Fliesen* No. 0 there are from two to three pieces contained in a Kilogram, in No. 1 from ten to twelve pieces, while in No. 9 there are about two hundred and sixty pieces. The rounder pieces are subdivided into about eighteen sorts according to size, of the largest of the pieces about ten would go to a Kilogram, of the smallest about sixteen hundred. From these chiefly beads are made, from the coarser beads for export to less civilised countries to the pale yellow olive-shaped bead necklaces to gleam on the throat of an Englishwoman or a Turkish lady, from the clear cut beads for Brunswick, France and Russia to the rosaries of the Catholics and Mohammedans.

The great quantities of amber produced being thus prepared and assorted, are now distributed among the ma-

nufacturers. When one considers that the world is large and that the whole of the amber used in it comes solely from the Palmnicken mines and the Baltic shores one can understand that not even this great quantity can supply the demand.

No. 123. *Exhibitor: Royal Amberworks.*

No. 123.

A large assortment (set) of raw amber as wall decoration, chiefly of such pieces as are suitable for mouth-pieces, Fliesen and Platten.

### VIII. The amber Industry of to-day and how it is represented at the Exhibition.

The quantity of raw material produced, the exactitude of its assortment, and the facility of traffic have raised the amber trade to a pitch which no other period could even approximately reach. The best example of the increase in this industry is given by America itself, where the amber trade has increased five-fold within the last ten years.

Amber used in America: —

1891 for 169 233,60 Mks.	1898 for 402 786,15 Mks.
1892 „ 186 951,30 „	1899 „ 514 609,95 „
1893 „ 137 307,65 „	1900 „ 485 292,20 „
1894 „ 290 738,25 „	1901 „ 618 297,50 „
1895 „ 300 081,93 „	1902 „ 834 522,08 „
1896 „ 407 733,05 „	1903 „ 885 332,24 „
1897 „ 354 736,20 „	

Amber used in the other countries: —

	1900	1901	1902
Germany for	260 900 Mks.	252 200 Mks.	706 856 Mks.
Austria „	691 100 „	634 500 „	1193 141 „
Russia „	149 200 „	171 300 „	181 924 „
France „	143 500 „	141 500 „	121 713 „
England „	63 600 „	51 200 „	48 328 „
Turkey „	60 300 „	68 700 „	75 214 „
Holland „	1 800 „	1 900 „	1 723 „



This represents a consumption of raw material amounting to:

	1900	1901	1902
Germany	29700 kgs.	29800 kgs.	58241 kgs.
Austria	22300 „	20700 „	30716 „
Russia	26200 „	27500 „	21826 „
France	2800 „	2650 „	2139 „
England	900 „	680 „	647 „
Turkey	1800 „	1450 „	2241 „
Holland	20 „	20 „	17 „

These are the proportions in which the several countries use up raw amber. Although the taste in the objects manufactured is somewhat similar in all civilised countries, still each country has a preference as to the colour of the amber. This is more especially the case, when civilisation has not yet reached the highest point and when national costume is still worn. Those articles of amber manufacture are therefore of special interest to which one can attach an actual ethnographical importance.

No. 124. No. 124. *Exhibitor: Royal Amberworks, Prof. Dr. Klebs, Königsberg. A. Zausmer, Danzig.*

Amberware for Exportation of ethnographical interest.

Especially remarkable are:

Beads (Amber corals) for the negroes of the Western and Eastern Africa.

Red cylindrical beads for Japan.

Green round beads (Mandarin chains) China.

Sacred amulets for Morocco.

Rings for China.

Plugs for the ears. Africa.

Royal ornament from Korea.

In this collective Exhibit modern artistic wares in amber are contributed by the following firms which I have mentioned in alphabetical order.

**ETZHOLD & POPITZ, Leipzig.**  
**Established 1864. Katharinenstr. 31.**  
**Manufacture of modern drawingroom  
clocks.**

*Depots or Agencies in  
Leipzig, Berlin, Cologne, Paris, Apeldoorn  
(Holland), Athens, Madrid.*

**\* Specialities: \***

GRANDFATHERS CLOCKS  
TIMEPIECES and DRAWINGROOM  
CLOCKS

*striking the half hour  
and the quarters.*

WALL CLOCKS with visible or in-  
visible pendulum.

*with 8 chimes and five  
gongs (chime clocks).*

**IN ALL STYLES AND AT**

**ALL PRICES**

*up to the finest*

**PRODUCTIONS OF ART INDUSTRY.**

The firm, in accordance with the purpose of this collective exhibit, has only sent a few specimens of clocks, inlaid with amber, which are novel both in design and execution. The firm would carry out any order in this style. Also the eight day clocks with polyphone-chimes can be supplied, with amber decorations. In these clocks the chimes are struck, hourly and half hourly, by the clockwork; they can however be stopped at any time and set on again without any interference with the works. The steel note plates are interchangeable: repertoire inexhaustible.

The firm Fritz Fehrmann in Tilsit was established as a working concern in 1881, and passed in 1886 into the hands of the present principal, who gained his experience by working for many years in the first jewellers' workshops. All the objects here exhibited are made and in some part especially designed for this Exhibition by Herr Fehrmann. Very interesting is the album which is a copy of that presented to His Majesty the German Emperor in 1902 by the Committee of the Louise Monument in Tilsit and



graciously accepted by him. The original album for the Emperor was also made by this firm. Not less interesting is the large chased silver bowl, which Herr Fehrmann has



TILSIT 1891. KÖNIGSBERG PR. 1895.


**FRITZ FEHRMANN, Goldsmith,  
TILSIT, East Prussia.**

*Workshops for jewelry and artistic wares in  
gold and silver in conjunction with amber  
and all kinds of precious stones.*

*Wholesale and Retail.*

*Gold Medal, Tilsit 1891, Königsberg 1895.*

executed after the design of Herr Bruno Möhring architect of the German Commissioner General, as also the coffee spoons with amber handles, and the silver statuettes and amber trays-



GOLDENE MEDAILLEN

250 Workmen.

Established 1882.

PAUL HÜBNER, BERLIN,  
Marcusstrasse 5.

**Manufacture of studs, brooches, breastpins  
in silver gilt.**

*Several gold Medals. This is the only  
ware of its kind that gained the gold medal  
in Paris 1900 and in St. Petersburg in 1902.*

*Exportation Agents:*  
*J. de Jongh & Co., Rue d'Enghien, Paris.*  
*Albrecht Richter, Neuburg 10, Hamburg.*

This firm was established in 1882 They turn out wares in gold, silver gilt, pinchbeck in conjunction with imitation stones, coral, mother's pearl, enamels of various

kinds. Recently they have introduced the use of real amber in their jewellery of which there is a selection in this collective Exhibit. The limitation of space in a collective exhibit necessarily prevents any but a very small selection being on view, thus what is here gives only a faint idea of the capabilities of this firm. Every one of their thousands of up to date patterns is designed specially for this firm by its own designers, so that all their work is original.

The firm also guarantees that their wares will not become discoloured in whatever climate they may be.

It has its own workshops tools, for enamelling and galvanising, as well as for cutting and polishing their stones, and they employ 250 workmen.

The studs are made with the "Ideal" metal spring, with chain and bar or various other mechanical systems of fastener.

These wares are extremely suitable for exportation as they are made to suit every taste: there is a special set of samples selected for America, which are here on view.

Orders however should not be sent direct to the firm but to its accredited agent.

**LOUIS MÜLLER & Co., BIENNE,  
Switzerland.**

*All lines of ladies watches 00 Size  
/ 10''' 1/2 / in Steel, Silver & Gold. Fancy  
watches a speciality.*

*Amber cases made at Königsberg i/Pr.*

This firm has its watchmaking works in Bienne, Switzerland, but has its amber wares made in Königsberg. Their watches encrusted with amber are very original and tasteful. This is an employment of amber which is quite new at the present day and is now introduced to fanciers for the first time. It must however be conceded that the idea of employing amber to decorate watches is not entirely new. In the time of Augustus der Starke (the Strong), that is at the close of the 17th. century watches encrusted



with amber were made for regal gifts. The originality of the idea, its connection with the amber industry and the partial manufacture of the watches in Germany were the reasons that weighed with the German Commissioner General in holding this firm justified, though domiciled in Bienne to take part in the Collective Exhibition.

**A. LEHMANN**  
**KÖNIGSBERG i. Pr., Steindamm 79/80.**

*Amber, ivory and wood turners  
and art carvers.*

*Silvermedal: Königsberg 1895. Grand Prix: Amber  
Collective Exhibit, Paris 1900.*

This firm sends a number of articles such as nicknacks in carved amber and so-called Danzig inlaid work jewellery etc. Every article was made by the firm in its own workshop.



*Manufacturer of Jewelry in Gold, Silver,  
Gold plate etc.*

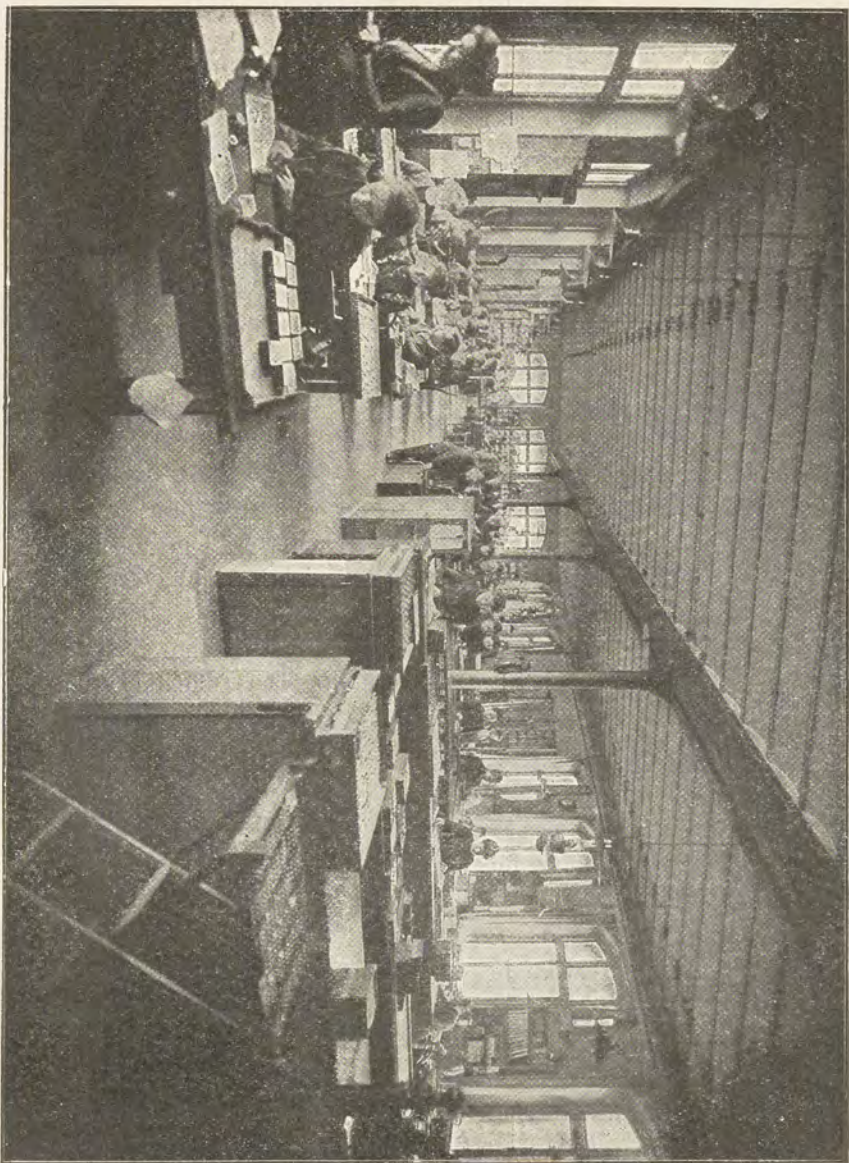
*Original Designs by renowned Artists. Constant  
Novelties. Numerous Patents.*

*Large Exportation. Sole Agents: F. Rosenstern & Co.,  
New York, 85 Leonard Str.*

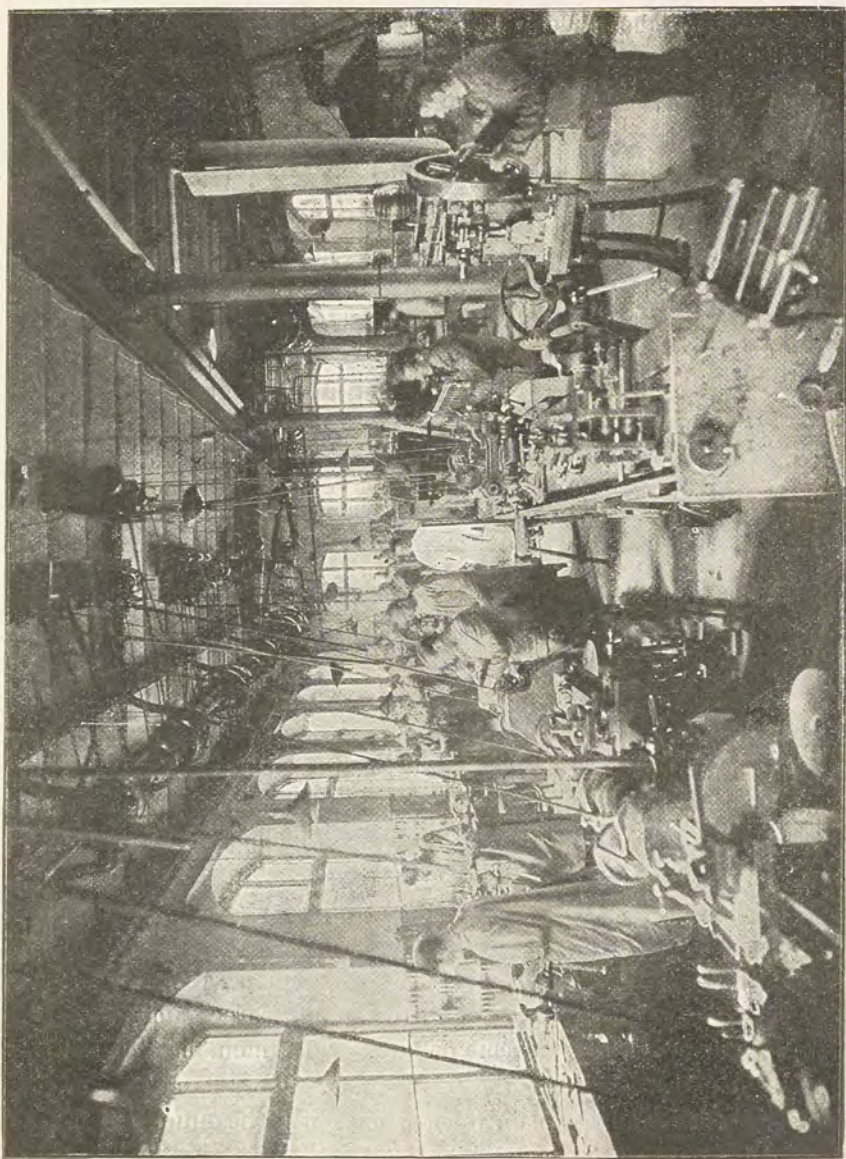
The firm of Aug. Richter in Hamburg sends a considerable collection of jewellery in real amber. Aside from the great manufacturing centres, this firm has risen to be one of the biggest of its kind entirely through the energy of its heads without any extraneous aid whatever. Everything that is necessary to the complete fitting out of the many articles manufactured, from sheetmetals and wires in different metals and alligations, to the cards on which the finished articles are sewed, are produced in the factory. The firm of Aug. F. Richter was founded in 1846 by the father of the present proprietors, Mssrs. Eduard & August Richter, on a very modest scale. Now, after an existence of 57 years, the factory owns a large complex of buildings, employs over 400 hands and the space occupied for manufacturing purposes only, covers an area of 38 000 ft. super. The working rooms are large, roomy and airy and so arranged, that everything can be easily surveyed. The work-rooms of this firm are shown in the pictures on pages 46 and 47). Six foremen are employed and in the offices 15 clerks, there are besides 50 young women, who keep the stock in order and expedite incoming orders. The Machinery of the establishment is operated by electricity, furnished by a 120 horsepower dynamo, there is besides, in case of necessity, an Accumulator battery of 62 elements. In a magnificent mechanical working room the firm makes all machinery necessary for the manufacture of their articles. Amongst these are especially the complicated machines for the production of automatic buttons. In the last working year, there were manufactured in Collarbuttons alone, 1 million 700 000. Latterly the establishment has been noted by the production of modern jewellery after the designs of noted artists as Bruno Kruse, Hans Dietrich, Leipheimer, Professor Kleemann, H. Baum and others and offers an abundance of "motives" in necklaces, brooches, girdle-buckles, chatelaines etc.

The rich and tasteful collection, to which each piece





Forwarding Department of the firm Aug. F. Richter, Hamburg.



Toolmakers Hall of the firm Aug. F. Richter, Hamburg.



careful attention has been paid, will be the means of largely extending the trade of Aug. F. Richter.

**E. ROSENSTIEL, BERLIN,**  
‡ Unter den Linden 48,  
**Purveyor to the Court. ‡**

*Established in 1825.*

*Articles for use and ornament in amber mounted in gold, silver and ivory, cigar and cigarette mouthpieces, from the simplest to the most elaborate style. Pipes in wood and meerschaum.*

*Designs by Ernst Rosenstiel, carried out on the premises.*

*Seven prize medals,  
including the large gold medal St. Petersburg 1903.*

This firm exhibits a number of artistic and useful articles, and works of art after the designs of one of the partners of the firm Ernst Rosenstiel. Among these articles are umbrella handles, bonbonnières, ornaments for the hair, necklaces, seals, paperknives, trays in the shape of shells and leaves. The most beautiful piece is a nautilus with amber shell carved in relief. In this piece different effects are obtained through different methods of treating the amber. Then a great selection of cigar and cigarette mouth pieces, from the very smallest to a greater than usual size, mouthpieces and pipes of all kinds and in every kind of mounting among the mouth pieces of every imaginable shade, those of perfectly transparent amber are remarkable for the extreme delicacy with which the material is handled. Besides these this firm shows large carved meerschaum pipes, plain wooden ones with beautiful mountings, large amber mouthpieces. By the plain meerschaum mouthpieces tipped with amber we see how well these two substances go together.

This firm turns out not only plain wares, but articles of great merit from an artistic point of view, and in several instances it has adapted amber in a way never thought of before. All their work is done on their own premises.

**UNITED PIPE MANUFACTURING Co. Ltd.**

**NÜRNBERG.**

Successors to Gebhard Ott, Ziener & Ellenberger.

*Briarwood pipes, cigar and cigarette mouth-pieces in amber, ambroid &c. — Exportation to all countries.*

*Gebhard Ott established in 1865.*

*Highly recommended in Philadelphia 1876, Vienna 1873, Nürnberg 1882, Leipzig 1880, Amsterdam 1883.*

The United Pipe Manufacturing Co. Ltd. Nürnberg successors to Gebhard Ott, Ziener and Ellenberger was founded on Jan. 1st. 1901 by the fusion of the firm of Gebhard Ott, which was founded in Paris in 1856 and removed to Nürnberg in 1865, with the newer firm of Ziener & Ellenberger. Herr Ott was the first to introduce the manufacture of briarwood pipes into Germany.

In the year 1853 some shepherds in the Pyrenees made for themselves briarwood pipes out of little briar roots in the most primitive way. With a centre bit they made a hole in the little root to contain the tobacco, then made a smaller one with a gimlet into which they inserted a quill. A few of these briar roots were taken by a French merchant to Paris and there Gebhard Ott, (now deceased) made the first pipes out of briarwood after the pattern of the then very popular clay pipes. Experience taught him that this Erica root was more suitable than any other sort of wood for making pipes, as it is extremely hard and an absolute non conductor of the heat engendered by smoking. In this way Herr Ott was the very first manufacturer of briar-root pipes. Briarwood is the wood of the root of Erica arborea L. which grows chiefly in the Pyrenees and on the islands of Corsica and Sardinia.



The largest roots are about thirty to forty kilograms in weight. Up till the year 1853, this wood had been used for nothing but firewood. When pipes began to be made of it, it naturally increased greatly in value. When the first specimens of briarwood pipes were brought to England in 1853, it was very soon recognised that this Erica wood was destined to become a most important article of commerce. Therefore the extraction of the roots was pursued in a more rational manner; sawmills were erected in the forests and the wood sawn into pieces suitable for exportation. In 1865 Herr Ott began to manufacture briarwood pipes with five workmen. From these small beginnings his manufactory increased, until now there are 200 workmen and women employed. The pipe patterns introduced at that time by Herr Ott are still preferred; the bowls are made of briarwood and the mouthpieces of amber, ambroid or any other suitable material. The firm manufactures also its own pipe cases, and employs about twenty five persons in this branch of their trade.

On Jan. 1st. 1888 Herr Gebhard Ott founded a pension fund which has to day deposits to the amount of nearly 90000 Mks. and has paid in pensions to workmen, widows and orphans nearly 28000 Mk. The chief markets for their wares are England and its colonies, Canada and America. The manufactures of this firm were awarded the medal for progress at the Vienna Exhibition in 1873, the gold medal in Philadelphia in 1876 and in Nürnberg in 1882, the diploma of honour in Leipzig in 1880, and the gold medal in Amsterdam in 1883.

**A. ZAUSMER, DANZIG, Langgasse 10.  
Manufacture of amber ware.**

*Established 1876.*

*Has been awarded eighteen gold, silver  
and bronze medals, and the Grand Prix in  
Paris in 1900 for Amber Collective Exhibit.*

The firm A. Zausmer in Danzig is one of the most important in the amber trade, it makes a speciality of amber beads, jewellery and nicknacks. The business has very much increased during the last few years, since Frau Kapüse assumed the direction of affairs after the death of her uncle Herr Zausmer. The firm has not stood still, but has left behind it the common and not always tasteful articles one sometimes sees in amber ware and has adapted itself to the requirements of the present day as regards tasteful and solid work and artistic finish. Hence the numerous awards.

In spite of the manifold uses of amber a great proportion of the middle sorts, too expensive for varnish, would have been practically lost for want of a use to put them to, but for the invention of a method whereby small pieces may be pressed together by hydraulic force. Amber is indissoluble either by the action of fire or of water; but at a temperature between 170 and 190° C. it softens without disintegration to about the consistency of india rubber.

While in this state small pieces are pressed together in the following manner, the pieces of amber, thoroughly cleansed and carefully freed by hand from its weathered crust are placed on a very strong deep steel tray which is closed with a pot like perforated cover. At a temperature of 200° C. these two vessels (the tray and its cover) are pressed together, so that the amber in its soft state is forced up through the holes of the sieve like cover, where in cooling it solidifies into a mass. In this way, by hydraulic pressure, one gets amber in the form of flat pieces which can be turned, bored and polished like natural amber. It is harder than the natural amber, but is inferior to it in brilliancy and polish.

The many difficulties which present themselves in pre-



paring amber for pressing and the waste which takes place, render pressed amber (ambroid) quite expensive, but the high price is counter balanced by the increase in adaptability and decrease of waste in turning. Pressed amber is therefore excellent for all cheap bulk articles, especially those used by smokers, as the use of wood, horn, bone, celluloid etc. are avoided for hygienic reasons and a permanent good appearance is not required. It is not adapted to fine manufactures. All pressed misty amber, having the colour of Bastard, undergo a change in a very short time after use; this is not only apparent on the surface but through the whole mass. The even cloudy appearance seen at first, becomes after a few months bony-white, rendering it uneven and disagreeable in appearance. The clear sorts retain their original quality, but can not be compared to the genuine natural amber in fire and lustre. The genuine amber will therefore always be preferred, unless for mere practical reasons, one sacrifices its many good qualities, its beautiful pure shades and its originality. It frequently occurs that dishonest dealers endeavour to sell pressed amber for the genuine sort and it is therefore wise to learn the distinguishing features. The natural clear amber is evenly transparent through the entire mass and possesses strong fire. The pressed amber is also transparent, but on close observation one notices that it is not perfectly clear. It contains undulating lines and elevated portions, which reflect the light in different ways. It reminds two liquids of different specific weight, for instance glycerine and water, about to combine; or of heated air, when passing into cooler, often described as "trembling air". This distinguishing feature is typical and is best visible when the object to be examined is so placed, that the light penetrates as large a mass of amber as possible. It is more difficult to distinguish the misty sorts. There are convex layers of misty and clear parts in pressed amber, caused by the manufacturing process; these have the appearance

of the wellknown Cirrus clouds. These layers show the flux direction taken when pressed; if a cigar holder is cut parallel to this flux, the misty layers can be seen above each other from the cigar and to the mouth piece. If the work is done at right angles to the flux, rows of these figures can be seen side by side, across the holder. Such peculiar misty spots are not found in the genuine amber. An experienced person can detect this mistiness immediately. If this is not the case, a microscope will give very reliable evidence. In misty amber, a large quantity of small bubbles have caused the mistiness, as already mentioned. These are round or rather oval and are located in a bed of clear amber. On pressed amber the ground is seen to contain a large number of flat crevice-like cavities which run in all directions or appear like moss. A slight trace is sufficient for this examination and this can be procured with a knife from a spot which escapes the eye.

**KÖNIGLICHE BERNSTEINWERKE**

(Royal Amber Works)

**KÖNIGSBERG PR.**

*Rawamber. Ambroid (pressed amber). Melted amber. Amber oil and amber acid. Statistical information concerning productions.*

The Royal Amber Works have placed on exhibition a pillar of pressed amber, 7 metres high, designed by the architect Bruno Möhring, Berlin. The rests of amber in the second pedestal, inside the carved work of light gray maple, are genuine amber and represent a journey of amber through the waves.

Efforts to colour an entire mass of amber have been recently successful, giving it similiarity to other stones. Coloured amber can be easily turned and polished and the colours are durable. On account of its great durability and elegant appearance, coloured amber will probably prove a



substitute for several other materials, used for decorative effect, where durability is required. This seems especially to be the case in manufacturing door-knobs, window-handles and similar objects. For such purposes it can compete with ivory, the finest material known. Both are very valuable, do not conduct heat and are equally durable. Ivory however changes its hue very quickly and becomes yellow, whereas amber retains its colour.

**ADOLF AMSBERG, AIX LA CHAPELLE**  
**Manufactury**  
**of Door and Window-Handels**  
**Bronze, Horn, Ivory, Coloured Amber etc.**

Ebony, horn and ivory were formerly the only materials used for door knobs and window-mountings and fine coloured effects were impossible. At the present time the use of amber has caused a revolution in this respect. This material is adapted to the most magnificent combinations of colours, harmonizing perfectly with the most elegant furniture and elevates a simple door-knob from mere practical service to a work of art. The firm Adolf Amsberg in Aix la Chapelle exhibits a number of such door and window mountings, parts for electrical lights etc., manufactured of various kinds and styles of bronze and mounted with amber.

The smallest pieces of amber are used for the manufacture of varnish. Amber is a mixture of several kinds of resin, distinguished by the difference in power of resistance to solution. By means of such solvents as alcohol, sulphuric ether, acetone or pure acetic acid, about 40 % can be withdrawn. The residue resists every known solvent. On addition to these resinous substances, amber contains in chemical combination, amber acid, in various proportion not exceeding 8 %.

On heating amber to 375° C. it melts and sets a large part of amber acid and volatile oil free in the form of a brownish substance, which can be dissolved in all ingredients, which are taken into consideration in the production of oil varnish. This so-called amber colophonium is considerably harder, has greater lustre and durability than copal, damara and other sorts used in the varnish industry, it mixes well with all colours used in trade and is therefore preferable, wherever these properties are more required than a light hue.

As large industrial plants are necessary for melting amber the Royal amber Works furnishes for trade various sorts, distinguished by a difference in hue; these are classified in numbers. Amber acid and amber oil are also furnished as secondary products.

The profits from melted amber and its byproducts are as follows:

1898 for	355 126,94 Mks.	1901 for	315 881,87 Mks.
1899 „	372 120,34 „	1902 „	273 853,41 „
1900 „	337 959,19 „	1903 „	277 448,06 „

The Royal Amber Works exhibit five sorts of melted amber:

- Placed in layers 1 mm thick between two glass slabs
- 10% solution in turpentine;
- Raw and refined amber oil;
- Raw and refined amber acid.

By means of melted amber, a varnish manufacturer is able to manufacture amber varnish, by dissolving the liquid in turpentine and adding the other ingredients which he is accustomed to use.

Many varnish manufacturers, however, purchase the raw amber and manufacture it into varnish according to their own methods.



**HERMANN SCHWARZ, MAGDEBURG.**  
**Varnish Manufacturer.**



*Established 1861.*

*All kinds of Oil and Alcohol Varnishes,  
Many awards.*

*Agencies in Berlin, Leipzig, Dresden and  
Hamburg.*

The manufactory covers an area of 4000 □m and was established in 1861 by Stadtrat C. Herm. Schwarz, who is at the head of the institution at the present time.

By fair dealing and thorough examination of all claims made, the firm has gained the confidence of the public to such a degree, that its annual productions have increased to 1000000 kgs.

The manufactory is engaged chiefly in preparing varnish for house and coach painting purposes. The firm has active business connections with government authorities, railway companies, German navy departments, as well as many industrial branches. The firm furnishes oil varnishes to manufacturers of:

Locomotives, Railway-Coaches, Machines, Tin Packing Boxes, Cycles, Sewing Machines, Furniture, Paper-Hangings, Oil-Cloth, Toys and to dockyards etc.

The firm furnishes spirit varnishes to manufacturers of: Furniture, Signs, Paper-Hangings, Placards, Yard-sticks etc.; Toys, Leather and the brasseries, iron foundries etc.

It is not intended, during the present exposition, to give a complete exhibition of what this manufactory is

capable of producing in the various lines of copal, asphalt, spirit and other varnishes, but rather to call attention to the many ways, in which pure amber and amber mixed with copal can be used. Very few products outside of this particular line have been included in the exhibition.

**CARL TIEDEMANN, DRESDEN.**  
**Oldest Amber-Varnish- and Color-Works.**

*Established 1833.*



*Speciality: Tiedemann's quick drying colored amber floor-varnish, an important factor for healthy dwelling-rooms. Amber-enamels. Painted and other samples of both articles.*

*Exported in tins with German, English, French, Spanish, Italian labels.*

*Gold Medal Paris Exhibition 1900.*

The firm Carl Tiedemann of Dresden shows specimens of its amber varnishes. This firm was established in 1833 and is one of the first that manufactured amber varnishes on a large scale. As far back as 1835 the firm employed raw amber in various methods as can be seen from the recipes for varnish in their books of that time. This business has remained in the family, and the successors of the founders of it have continuously been supplied with amber from the Baltic. They have thus contributed in a great measure to the introduction of this hardest and most durable of raw materials for varnish into the most diverse branches of trade and have themselves greatly extended its use by employing in their floor varnishes, com-



bined with paint. Tiedemann's Amber Enamel Varnish Paints of various colours in small tins are quite as popular as his colourless Amber Varnish for chairs, tables, vessels, railway carriages and many other trade uses. A special notice of the varnishes of this firm along with samples of colours accompany this guide.

**JOH. GUMBOLD,**  
**Joinery and Cabinet making,**  
**Königsberg in Prussia.**

Special attention is called to the fact that the Exhibit cases are made by the firm Joh. Gumbold, Königsberg, after the design of Bruno Möhring, architect, Berlin.

### **Conclusion.**

With the foregoing words I hope to have furnished not only a guide to this collective exhibit, but also a history of amber, which though limited by the exigencies of space and purpose, has still touched on every thing of interest connected with it. After reading this however, the following question will unvoluntarily occur to the reader: What quantities of resin must these conifers have produced to have supplied the world for thousands of years? and how long will the supply hold out? Both these questions are pertinent. The first one is best answered by analogy with living trees. The fir resin trade manages to torture to death a respectable number of conifers for their supply of turpentine and gallipot resin through wounding the bark. The *Pinus nigra* for example between 60 and 80 years produces from 4 to 10 kilos of turpentine, and from 1 to 3 kilos. of thick resin, in all about 120 kilos. of thick resin: the *Pinus maritima*. Poir. as much as 400 kilos of Gallipot in the same time, *Abies*

excelsa D. C. 220 kilos, *Pinus silvestris* L. 150 kilos. and even the *Larix europaea* L., which is poor in resin, 50 kilos. of pure turpentine.

In order to come to definite figures let us calculate the extraction of the year 1902. In 1902 there were 36750 cub. m. of soil exhausted and from that surface was taken 406, 397 kilos of amber, or 11 kilos to the square yard. A *Pinus nigra*, requiring a surface of about 10 cub. m. produces to this surface 120 kilos of thick resin, or 10 kilos more than from the same surface of amber pine or *Pinites succinifer*. When one considers that not one tree trunk but generations of them produced the amber, and that the Blue Earth was probably washed together from large areas, one will find that in the formation of amber no other conditions can be assumed, than those that prevail to-day.

The second question is also easily answered, as careful borings have shown, that even at the present rate of excessive exhaustion, there is Blue Earth to supply us for 50 or 60 years yet. Scientifically, however, it is more than probable that the amber bearing stratum may extend so far into Samland, as to provide a supply for a much longer time.

And now I come to the end of my guide.

We have let the amber speak for itself, we have seen its parent plant, which drew its life's sap from the old chalk soil, to turn it again into the precious resin. We have seen how the amber was preserved, when its parent trees had long fallen into dust, how it had even outlasted the soil of the country it was bred on, and was deposited on strange ground. It resisted the onward pressure of the glaciers of the Diluvium and the force of its released streams, as today it resists the power of the waves, and holds fast every thing it has once grasped, the wood of its parent tree, the plant and animal life of its surroundings and even its own liquid form. So the amber became a guide for us through various periods in the development of our globe and misty ages in the history of mankind. It



has led us through four thousand years and years to the modern branches of trade, represented in this Exhibition.

With a certain amount of pride in my native country of East Prussia, I can conclude my guide in the hope that I have succeeded in proving that nowhere else in the world can any other production surpass in varied interest the amber of East Prussia. In East Prussia a number of favourable circumstances combined to produce such a supply of amber as to make it worth extracting. First the circumstance of the parent resin bearing trees close together in the virgin forest, then their decay and disappearance in such process that the amber was not dispersed, and finally the resisting power of the deposits against the alternate attacks of ice and water, so that it could remain undisturbed for us. It is entirely due to the combination of all these favourable circumstances, that it is possible to mine in the blue earth profitably. It may be assumed that the amber bearing tree grew elsewhere during the Tertiary Period, but a repetition of all these happy circumstances is hardly to be thought of. Therefore the whole amber trade will continue to be dependent, as heretofore, on the

### **„Samland Gold of East Prussia“.**

Königsberg, January 1904.

**Prof. Dr. R. Klebs.**



Unsurpassed for its drying qualities,  
hardness and brilliancy.

**Does not crack or peel!**

Genuine oil varnish!

## The Floor Varnish of the Century.



# Tiedemann's Amber Varnish



always ready, non smelling, genuine, quick drying  
**in all colors.**

Dries in one night. Greatest durability. Does not stick.

A boon for all economic house wives.

Used since **1833.**

**Received the gold medal at the  
Paris Exhibition 1900.**

**Caution!**

Only genuine with this trade mark stamped on every tin.



9<sup>a</sup>

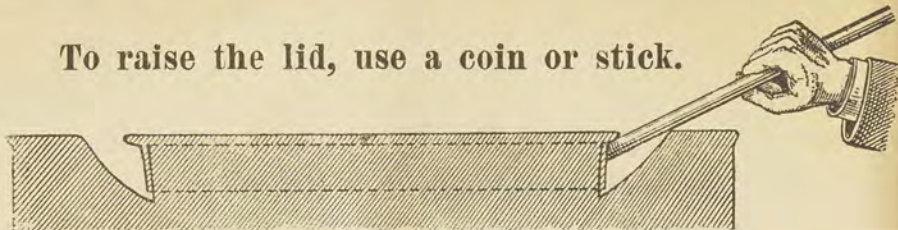
To be had in any color required.

Directions for use on the following page.

P. T. O.



To raise the lid, use a coin or stick.



## Directions for use.

### Tiedemann's quick drying Amber Varnish

is ready for instant use and can be applied by anyone.

1 Kilo sufficient for 15 □ Yards.



To varnish unpainted boards:

1. clean the surface to be treated, with pure water without soap, or scrub it with steel shavings.
2. apply one coat of strongly diluted oil color or a mixture  $\frac{1}{2}$  varnish and  $\frac{1}{2}$  turpentine and when perfectly dry,
3. apply one or two coats of the Amber varnish, first across the grain, then with the grain.

Worn places to be treated in the same way. Painted boards which require renewing must be freed of all dirt, bad paint and varnish by scrubbing with steel shavings then treated as above, after the whole floor must be revarnished once or twice with Tiedemanns Amber Varnish.

To lift the lid of the tin use a chisel, knife or large coin etc. The varnish must be well stirred with a stick before and while in use, and applied thinly with a painters brush.

**Too thickly applied color or varnish dries with difficulty, sticks and wears off quickly.**

The second Coat must only be applied when the first is thoroughly dry. A coat is properly dry when one can hold the palm of the hand for a minute on the surface without a feeling of stickiness.

Cracks in unpainted floors must be filled up after the first coat, in painted floors before. Fresh air or warmth helps the varnish to dry but sunshine must be shut out.

When the floor is thoroughly dry it should be washed with cold water.

Never mix the varnish with another substance — only in the case of some being left over (the tin must always be kept well closed), it may be diluted with a little turpentine before using again.

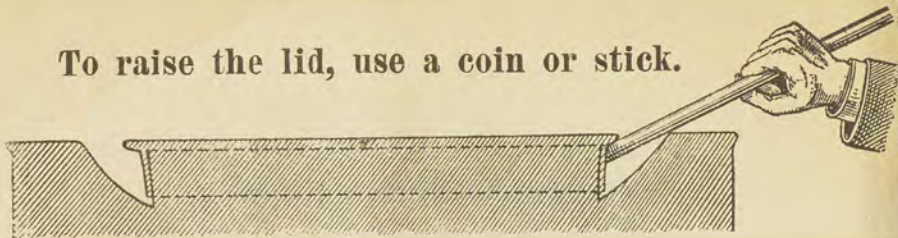
Tiedemann's Varnish is excellent for doors, windows, stairs, stone floors, damp walls, furniture etc.



ST. LOUIS,  
UNIVERSAL EXPOSITION 1904.



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THIS SIDE IS EXCLUSIVELY FOR THE ADDRESS.

Post Card

