into their bronzes. Thus, a certain bronze for statues was formed by fusing together 100 parts of copper, 10 parts of lead, and 5 parts of tin. In a very ancient bronze armlet (probably Phœnician) found in this country, and belonging to a period anterior to the Roman occupation, Prof. Church found—

Copper	86·49
Tin	6·76
Zinc	1·44
Lead	4·41
Oxygen and loss	·90
	100·00

Bronze was very much used in Egypt for vases, mirrors, arms, &c. These, according to Sir G. Wilkinson, usually contain from 80 to 85 per cent. of copper, with from 15 to 20 per cent. of tin. By the use of some acid substance, the surface was sometimes covered with a green or brown patina. Although the casting of the metals was not known in Greece in the time of Homer, bronze was probably cast in Egypt 2000 years B.C.

Several compounds of copper were used by the ancients, both the red and black oxide were obtained by heating copper to redness, and allowing it to cool in the air; they distinguished between the scales which fell off during cooling, and those which were caused to fall off afterwards by blows of a hammer. These oxides were principally used for colouring glass. Verdigris or acetate of copper was obtained as now by covering plates of copper with the refuse of grapes after the expression of the vine juice. Copper pyrites and a rude kind of sulphate of copper would appear from Pliny's obscure account to have also been known.

It follows from the above remarks concerning bronze, that tin, like copper, was known at a very early date. This is the more remarkable, because it has always been a comparatively scarce metal, and it was obtained from distant localities. Formerly it was almost entirely supplied by Spain and Britain. The Phœnicians, who were the earliest traders, obtained it first from India and Spain, and afterwards from Britain. The Greek name for tin, kassiteros (κασσιτέρος), was perhaps derived from the Insulæ Cassiterides, or Scilly Islands, from whence the Phœnicians asserted that they procured tin; but it has been suggested that in all probability they invented the story because they desired a monopoly of the metals, while in reality they procured all their tin from the mainland of Cornwall, where it has always abounded. Tin must have been very valuable, or the Phœnicians would not have traded so far for it. Homer evidently considers it of far greater value than copper. In the time of Pliny it was worth about eight shillings the pound. The metal was known in Egypt 2000 B.C. Pliny mentions that it was found in the form of small black grains in alluvial soils, from which it was obtained by washing; this account would agree with a description of the so-called *stream tin*, which is tin ore separated from the parent vein, and carried down by streams. It is an oxide of tin, and the metal is obtained from it by strong ignition with charcoal. Tin was used for tinning copper vessels, for making mirrors, and in the manufacture of bronze. In the Iliad the greaves of the armour of Achilles are made of tin, and it enters into the composition of the shield; it was also used for coating copper.

G. F. RODWELL

(To be continued.)

SCIENTIFIC SERIALS

THE *Bulletin de l'Académie Impériale des Sciences de St. Petersbourg*, xvii., No. 2, commences with a proposed new classification of the Balænoidea, by J. F. Brandt, with the view of including extinct forms recently met with in Central and Southern Europe, and in Central Asia. He bases it mainly on skeleton structure, with special reference to form of cranium. The next paper contains some algological studies by Christopher Gobi. He describes how moisture, with heat and light, acts on chlorophyll in the cells of Chroolepus, accumulating it at the periphery, and leaving a nucleus of red pigment at the centre. He also describes a new species of the plant, which he terms *Chroolepus uncinatus*. It is found on the maple, ash, and linden, and its chief characteristic is a hook-shaped zoosporangium with subsporangial cell at the end of a series of irregular cylindrical-shaped cells forming the stalk. The growth of the zoosporangia takes place only at night. This new species is most closely allied to the *C. umbrinus*. —C. J. Maximowicz gives a full description, in Latin, of certain plants in Japan and Mandshuria.—The last paper is by C. J. Maximowicz, on the influence of strange pollen on the form of fruit. He experimented with two very distinct species of lily, *L. davuricum* and *L. bulbiferum*, kept in a room warmed by sunlight. He fertilised the flower of each with pollen from the other, and the process was repeated in several individuals. When the capsules developed, each was found to have the form characteristic of the other plant. The form of the seeds in both was intermediate between those of the parents.

Annalen der Chemie und Pharmacie, No. 9, 1872.—The first article, by Dr. Schreder, describes a new product of styphnic acid, obtained by reaction of cyanide of potassium with the neutral potassa salt of the acid. He names it *Resorcin-Indophan*, and gives as its formula $C_9H_4N_4O_6$. It is soluble in water, but insoluble in alcohol and ether. The potassa, soda, and baryta salts of the substance are discussed.—In a paper on some combinations of vinyl, Dr. Baumann describes the action of sodium methylate on an excess of iodide and bromide of vinyl at ordinary temperature; experiments on the action of cyanides of potassium and of silver on bromide of vinyl; and the conversion of bromide and chloride of vinyl into isomeric bodies.—An essay on camphoric acid, by F. Weeden, contains an account of a new modification, called meso-camphoric acid, obtained by action of hydriodic and hydrochloric acid on dextro-camphoric acid; its formula is $C_{10}H_{16}O_4$. He also treats of substitution products of camphoric acid anhydride and of amido-camphoric acid.—A paper on "Carbazol," a substance prepared from coal-tar oil, is furnished by C. Graebe and C. Glaser; and Herr Graebe also communicates a note on "Vapour Densities of some Aromatic Compounds of High Boiling-point."

Poggendorff's Annalen der Physik und Chemie, No. 6, 1872.—This opens with a detailed account, by Dr. Rudolph Kœnig, of his various experiments with manometric flames. His apparatus is based on the effects of sound-waves upon a membrane presented to them, which, in its turn, affects a stream of gas flowing to a jet, causing the latter to dance. The jet is imaged on the mirror-covered sides of a revolving box, and its successive motions (caused by the sound and varying with it) appear from the reflection, which, through the box's motion, becomes a luminous line of images. Dr. Kœnig has successfully employed this method in the study of various acoustical effects—combinations of notes, vowel sounds, "overtones," interference, &c., and the varieties of flame-forms produced are fully shown by numerous drawings.—In the paper following, S. Lamansky describes a series of careful experiments on the heat spectra of the sun and the lime light. The absorption bands in the ultra red of the former had the same position, though the prisms were varied, those used being flint glass, bisulphide of carbon, and rock salt. The position and intensity of the heat maximum and the intensity of absorption were found to vary with the time of year and of day at which the observations were made. The heat spectrum of limelight is continuous, and its maximum further removed from the end of the visible spectrum than in the case of sunlight.—E. Hagenbach continues the account of his experiments on fluorescence of various substances; and H. Weber communicates a paper on the Heat Conductivity of Iron and of German Silver.—The serial also contains (of original articles) a short note from Prof. Clausius in reply to Prof. Tait's last communication; a description of an improved Holtz machine, by W. Musaeus; a note on the spectrum of aurora, by A. v. Oellingen; and one or two others not calling for special notice.

THE *Scottish Naturalist* for October opens with an article by Mr. J. Allen Hooker, on "The Study of Entomology," containing some very useful hints to young entomologists as to the direction in which their studies and observations can be most usefully turned, some of which are all but entirely neglected by collectors in this country. Mr. James Hardy then describes his new "Ragwort-seed Fly," *Anthomyia Jacobææ*; and Dr. Buchanan-White concludes his account of the nest of *Formica rufa* and its inhabitants. A number of items of information of especial interest to Scottish zoologists and botanists fill up the number. In both the last two numbers there are instalments of the "Insecta Scotica," the Lepidoptera of Scotland by Dr. Buchanan-White, and the Coleoptera of Scotland by Dr. D. Sharp.