the year ended June 30, 1888, 69,623,795 pounds of oleo oil in nine States. There were used in the manufacture of oleomargarine, as stated in the manufacturers' returns, 12,265,800 pounds during that period, and 30,146,595 pounds were exported, leaving 27,211,400 pounds used otherwise. As oleo oil is sold at a much higher rate than tallow, it is presumable that this large quantity is used in some other food products, as emulsified cream and cheeses.

EDGAR RICHARDS.

NOTES AND NEWS.

IT is proposed to construct a railroad tunnel under the Narrows in New York harbor, to connect Long Island with Staten Island. A company has been incorporated to build the railroads connecting with the tunnel, and part of the route has been surveyed. The total length of the tunnel will be less than two miles, a great part of the way through easily worked stone.

— The first convention of the North American Association for the Propagation of Volapük will be held in Boston, Aug. 21, 22, and 23. According to Article IV. of the Constitution, "Any Volapükist may become a member by sending one dollar to the Lepenädan," Mr. C. C. Beale, No. 180 Washington Street, Boston, Mass. This entitles to the grade of membership called kopanel or associate member. "Upon proof of proficiency a kopanel becomes a kopanal or active member. Only the latter may vote or hold office."

—The thirty-ninth meeting of the American Association for the Advancement of Science will be held at Indianapolis, Ind., beginning on Aug. 19. Members desiring to attend are expected to pay full fare at the point of starting, and should have the ticket agent furnish a certificate which will entitle the holder, upon being indorsed by the secretary of the association, to a return ticket at one-third of the regular fare. The railroads of the country are divided into different passenger associations, and if the member's route covers more than the territory covered by one such association, a separate certificate must be taken covering each association's territory traversed. The railroad companies have established the following rule: "No refund of fare will be made on any account whatever because of the failure of the parties to obtain certificates." The local secretary, or assistant, will be in attendance at a temporary office in the Union Station, or immediately opposite, during the first two days of the meeting, while members are arriving, to furnish any special information which may be desired. The place of meeting is in the new Capitol Building, where rooms will be furnished for all the officers, sections, and committees under one roof. The post-office authorities have kindly arranged for a branch office at the Capitol, so that all mail matter will reach its proper destination if addressed, "Care of A. A. A. S." A room will be provided for storage of apparatus and specimens sent by express, and all packages may be addressed "in care of the local secretary." The council will meet at the Denison Hotel parlors at noon on Tuesday, Aug. 19. The opening general session will be on Wednesday morning at the Capitol Building, when President Mendenhall will resign the chair to his successor, Professor Goodale. On Wednesday evening the retiring president will give his address in Plymouth Church. This will be followed by a reception of the association by the local committee and citizens at the Institute for the Blind. With the exception of Saturday and Sunday, the sections will hold morning and afternoon sessions until Tuesday evening, when the general closing session takes place. On Monday afternoon a special train will take the botanists to South Waveland. The Science Club, of Terre Haute, has invited Sections B, C, and D to hold their session at Terre Haute on Friday, where a visit will be made to the Rose Polytechnic Institute. The citizens of Lafayette have extended an invitation to Section F to visit Lafayette. The above invitations from Terre Haute and Lafayette will be accepted if approved by the council. On Wednesday a special excursion will be run to the Mammoth Cave. On Saturday an extensive trip will visit the gas territory of Indiana, and a visit will be made to the largest plate glass factory in the United States, and other concerns where natural gas is applied to manufacturing uses. For all matters pertaining to membership, papers, and business of the association, address the permanent secretary, Professor F. W. Putnam, until Aug. 15, Salem, Mass.; after Aug. 15 at the Denison Hotel, Indianapolis, Ind.

—A steam life-boat which recently made her trial trip in England is described by the London journals as being built of steel, with fifteen water-tight compartments. The boiler and engine rooms are brought up about three feet above the main deck, and are closed by iron covers to the man-holes, air being supplied by forced draught. The passengers' space is abaft the engines, seated all round, and will hold about thirty persons. The mode of propulsion adopted is a turbine, taking in water through the bottom of the boat at its apex, and discharging the water when it has attained its maximum velocity through tubular orifices on each side. About one ton of water per second is discharged. The speed at which the vessel ran on her trial trip was over eight knots. From full speed ahead the vessel can be stopped in thirty-two seconds, and way can be got on her again in four seconds. She carries a mast with some sail power forward, the mast being lowered when needful. The new life-boat is stationed at Harwich.

— If we follow the march of the vicissitudes of temperature, evidently determined by some cosmical agency, says *Nature*, we find at the beginning of Tertiary times a moderately warm climate; then a rise during the Eocene, and then a gradual cooling, interrupted possibly by some oscillations, down to a degree nearly corresponding to that now prevailing, at the beginning of the Pleistocene epoch. Then the cooling continued below the present temperature, to a minimum at the time of the greatest glaciation of the land; then a re-warming in the inter-glacial period nearly up to the present temperature; after which cold and glaciation regained the upper hand, finally to give way to the present conditions, which are about midway between the greatest warmth of the Tertiary age and the greatest cold of the Pleistocene. One fact stands out conspicuously, viz., that these changes progressed very irregularly, and were subject to much oscillation, and the period during which we can approximately follow the course of the change is much too short to enable us to learn the law that regulated it. We can not decide whether oscillations like those of the Pleistocene will be repeated, and we are now progressing towards another temporary Glacial period, or whether we have to expect the return to a warmer temperature such as prevailed in Tertiary times, or, finally, whether the outcome of all the deviations will be a lasting refrigeration of our climate. Just as little can we determine at present by what agency all these vicissitudes are brought about; most plausible and simple would it certainly be were the sun a variable star that at different periods emits different quantities of heat; but for this or any other assumption there is no proof forthcoming. This enigma, like so many others, will some day be solved by man's searching intelligence, but, like all other acquisitions of science, this goal can be won only by assiduous and patient labor. Haply the triumph may not be for our generation; but what we may certainly accomplish is to prepare the way to it, by an accurate and critical collection of the facts.

—In no other Scandinavian country is school education a State affair to the same degree as in Sweden, says a correspondent of the London *Journal of Education*. Not only are the higher secondary schools public, as in Norway and Denmark, but all primary schools are subject to public regulations and controlled by public functionaries, and the elementary teachers are appointed by the authorities. Likewise, the intermediate schools are nearly always public institutions, whose masters are civil servants, with all the duties and privileges resulting therefrom. In Norway, intermediate school education is in most places municipal, with State subvention, although the towns which have public secondary schools also have public intermediate schools; while in Denmark the intermediate schools are always municipal or private. The result of the Swedish system is that their schools are excellent, as the public appointment and the independent position of almost all the teachers greatly contribute to attract talented young

collegemen to a scholastic career. As in Denmark and Norway, no teacher can be appointed in primary schools, or to the lower classes of intermediate schools, who has not studied at a training college. In the higher classes of intermediate schools and in the secondary schools nobody can be appointed who has not passed the so called teacher's examination at the University. To pass this examination necessitates, in all the Scandinavian countries, a course of studies of five to six years at the University. All the teachers appointed have, accordingly, all the scientific requirements for a good teacher. Another salutary result of the system is that the school education is not expensive, being almost gratuitous, which has the effect of opening a career for all in the civil and clerical service. On the other hand, this nearly free education has, as a matter of course, given rise to a large conflux of office-seekers and place-hunters, and has, on the whole, made the struggle for life not any easier among the professional classes.

—It is stated by the *Engineering and Mining Journal* that the project for making Paris into a port is now completed, and nothing remains but the sanction of the Government to put the works into the hands of the contractors. Hitherto the Government has kept aloof from the proposals until its promoters were in a position to carry out the undertaking to a successful issue, a caution engendered by the recent failures of French engineering undertakings. The promoters have now raised the necessary capital, amounting to £5,400,000, and it is probable that the sanction of the government will be given to the project, and the work of canalizing the Seine with a view to allowing the passage of sea-going vessels from Havre to Paris will be proceeded with, and extensive docks will be constructed at Pantin, on the north-east of the city. Another proposal is for the construction of a canal to connect the Mediterranean with the Bay of Biscay, with the intention of intercepting a great part of the shipping which at present passes through the Straits of Gibraltar. If these two projects be carried out, they will have an immense effect on the trade of France.

—An East India newspaper, quoted by *Nature*, reports the result of a recent expedition to investigate the upper course of the Irawadi, the source of which, as is well known, is one of the still unsolved problems of geography. It has long been known from native report that two rivers, the Mali Kha and the Meh Kha, the former from the north, the latter from the east, unite a little below 26° north latitude to form the Irawadi. The sources of the Mali Kha are known to be in the mountains to the east of the Brahmakund, which form the south-eastern water-parting of the Lohit Brahmaputra; but the Meh Kha, which is stated to be the larger stream, and which Colonel Walker supposes to be identical with the Lu River of Tibet, has never before been seen by any European. The junction of these two rivers has now for the first time been reached by an expeditionary party ascending from Bhamo. On May 27, Captain Barwick, of the Indian marine, accompanied by Mr. Shaw, the Deputy Commissioner of Bhamo, and Major Fenton, of the Intelligence Department, left Bhamo in the "Pathfinder," a paddle-steamer of about thirty-five tons, with a view to reaching the point of confluence. From Bhamo as far as Maingna the stream is well known. Above Maingna the river runs between mountains from one thousand two hundred to two thousand feet high, and a succession of rapids has to be passed through, which by dint of hard struggling and after many attempts the "Pathfinder" successfully ascended, not, however, without several hairbreadth escapes from foundering, the whirlpools simply taking charge of the vessel. After six days' steaming, the party reached the confluence of the streams, distant about one hundred and fifty miles from Bhamo. Here the river was found to be five hundred yards wide, one branch, the Mali Kha, trending to the north-eastward, the other, the Nmaika (Meh Kha of the map), to the eastward. Up the former the explorers proceeded some six miles, and then came upon a series of rapids. It was decided not to go further, as the small quantity of fuel remaining was reserved for steaming up the other branch. A halt of a day was made, and the position fixed in 25° 56′ north latitude, and 97° 38′ east longitude. Returning to the confluence, Captain Barwick proceeded three miles up the Nmaika, when a rapid prevented further progress. The Kachins are said to have been very friendly, though they had never seen or been in communication with Europeans before.

—In the second part of the first volume of the Transactions of the Royal Society of Victoria Mr. A. W. Howitt, in a well-arranged and instructive paper, deals with the organization of Australian tribes. The following are among Mr. Howitt's conclusions, as given in *Nature*:—(1) The group is the sole unit. The individual is subordinate in the more primitive form of society, but becomes more and more predominant in the advancing social stages. Thus group marriage becomes at length completely subordinate to individual marriage, or even practically extinct and forgotten where descent has been changed from the female to the male line. (2) An Australian tribe is not a number of individuals associated together by reason of relationship and propinquity merely. It is an organized society governed by strict customary laws, which are administered by the elder men, who in very many, if not in all, tribes exercise their inherited authority after secret consultation. (3) There are probably in all tribes men who are recognized as the headmen of class divisions, totems, or of local divisions, and to whom more or less of obedience is freely given. There are more than traces of the inheritance by sons (own or tribal) of the authority of these headmen, and there is thus more than a mere foreshadowing of a chieftainship of the tribe in a hereditary form. (4) Relationship is of group to group, and the individual takes the relationship of his group, and shares with it the collective and individual rights and liabilities. The general result arrived at is that the Australian savages have a social organization which has been developed from a state when two groups of people were living together with almost all things in common, and when within the group there was a regulated sexual promiscuity. The existence of two exogamous intermarrying groups seems to Mr. Howitt to almost require the previous existence of an undivided commune from the segmentation of which they arose.

—In his monthly report for July, Arthur Winslow, State Geologist of Missouri, states that the work of detailed mapping in the coal fields has progressed without interruption, one hundred and ten square miles being covered in the field during the month. A portion of the results of this work has been reduced and transferred to the final sheets, two of which will soon be in a condition for engraving. Detailed work has been started in Randolph County, and Professor C. H. Gordon, of Keokuk, Iowa, a volunteer assistant for the summer, has been assigned to this work. On July 7 detailed work was started in Greene County under Professor E. M. Shepard of Springfield, local assistant on the Survey; with him is Maj. E. W. Newton of Bolivar, also a local assistant. Over fifty square miles have been covered in that county. The detailed mapping of the crystalline rocks in south-east Missouri has also progressed uninterruptedly, and about seventy square miles have been covered. Field-work on the clays and building stones of St. Louis has been completed, and the report on the results is in course of preparation. In the Laboratory the report on the mineral waters of Henry, St. Clair, Benton, and Johnson Counties has been written and is ready for publication. It will be issued in the next Bulletin. Further analyses of thirty limestones have been made, some nine miscellaneous specimens have been determined or analyzed for the Survey, and sixteen lots of specimens from outside parties have been examined and reported upon. Preliminary inspections have been made in Clarke, Scotland, Randolph, Monroe, Marion, and Franklin Counties, with the object of determining the character and amount of work which will be necessary in the future in the sections which they represent. In the office, a large amount of time has been spent in labelling and filing away for future reference and study the already bulky collection of the Survey, which now includes over one thousand three hundred specimens. A large number of valuable illustrative specimens have been collected during the past month, in addition to these, and will soon be shipped to the office. Some progress has been made in the arrangement of specimens in the cabinet, for exhibition, a few of which are now classified and labelled. Paleontologic work has been in progress in Henry and St. Clair Counties.