thereby arresting the solids on the surface layer of the filter, where it can obtain a greater amount of oxygen than lower down the filter. The advantage of having the larger materials at the bottom of the filter is the increased drainage effected, as the resistance through friction is much less than it is with the top layer of smaller material. Experience has proved that good drainage of the lower portion of a percolating filter is absolutely necessary, and to obtain the best results a smooth surfaced material such as gravel is found to be the most efficacious.

There are many things connected with sewage purification that require elucidation before it can be said to be on a strictly scientific basis, but with the combination of the labors of all those working on the subject, also patient investigation by those working every day on the purification of sewage, this subject may in the future be on as much a scientific basis as many of the industries are to-day. One who sees a filter every day notices that there are many changes taking place during a year, for instance. At times the surface is covered with a dirty greyish colored growth; after a time this gives place to a greenish colored growth. At another period there is no growth perceivable; sometimes the various growths are in varying sized patches; also the amount of humus matter being discharged increases suddenly; the degree of purification at times is unaccountably affected.

To find out the cause and effect of these changes will no doubt help forward not only the solving of the problem of sewage purification, but help to place it on a scientific basis, so any sewage works manager that has the courage to tackle the investigation of any one of the changes that goes on in a percolating filter will have his patience well tried, and, if successful, will be rewarded with the pleasure of having attained something towards building up the science of sewage purification.

Where, as in most cases is the case, the expenditure in the construction of the filters is limited, it is much better to spend money on that portion necessary for the purification, such as the distribution, filtering mediæ, and drainage, than on having artistic walls, as no matter how pleasant to the eye a set of filters may look to outward appearance, if they do not do the work expected of them the manager does not derive much benefit from the artistic appearance.

Sewage purification, as regards the liquid portion, has got to such a pitch that, provided the money is forthcoming, any degree of purification can be attained, but the question to my mind is can the same purification be obtained with less expenditure, or can a greater quantity be purified with the same purification and the same expenditure.

BOLT SOCKET FOR CONCRETE CONSTRUCTION.

A simple and effective type of bolt socket to be inserted in concrete was recently patented and is now manufactured by David Craig, Boston, Mass., says Engineering News. It is made by forming a round wire into a helical coil just fitting into the thread of a lag screw or bolt, leaving the ends of the wire extending tangentially from the circle of the helix. This formed wire is then placed on a so-called "master bolt" and placed through the form in which concrete is to be poured. When the concrete has set the "master bolt" is removed, leaving the wire to form the female screw in the concrete, into which the bolt may be screwed at any time. It will be noted that the ends of the wire protrude into the concrete, forming an effective reinforcement of the concrete, as well as holding the screw bore firmly in place. These sockets are made in various sizes and lengths, the latter being short, so that if a long bolt is required the socket may be in two or more pieces, each piece with its protruding ends acting to hold the socket in place.

The main use of such a socket is to provide means for attaching hangers of whatever sort to the members of reinforced concrete structures, but the Craig socket has been most successfully used by the Boston elevated railway with separately molded concrete work to tie together two adjoining pieces. It should be noted that with this socket, as in all other metallic sockets, insulation should be provided to prevent the transmission of any electric current to the reinforcement.

PERSONAL.

Mr. T. H. McCauley has been appointed consulting engineer for the street railway system of the city of Lethbridge, Alta. Mr. A. Reid has been placed in charge of the organization work.

Mr. Joseph E. Chalifour has been appointed chief geographer for the Dominion Government. He takes the place of the late R. E. Young. Mr. Chalifour has for three years been assistant geographer to the Dominion.

Mr. Provost Hubbard, Chief of the Division of Roads and Pavements of the Institute of Industrial Research, has been appointed lecturer in Engineering Chemistry at Columbia University. He will conduct the courses in Bituminous Materials given in connection with the graduate courses in Highway Engineering.

Mr. Harry C. Oswald has been appointed assistant secretary of the Canadian Pacific Railway Company. He has been connected with the company for the past twenty-six years, during which he has capably filled various positions in several departments. The recognition of his services is welcomed by his many friends, who feel that in his new position he will acquit himself as ably as he has in the others he has filled.

Messrs. W. E. H. Carter and Alexander H. Smith have formed a partnership as consulting mining engineers, to be known as Carter & Smith. Their head office will be Canadian Mining Journal, Toronto.

Mr. Carter is a graduate of the School of Practical Science of the class of '98, and has had a general experience along the line of mining engineering. For some years he was Inspector of Mines for the Province of Ontario, but during the last few years has been in consulting practice only.

Mr. Smith is also a graduate of the School of Practical Science. He has had considerable experience in gold mining in Mexico, being for some years manager of certain of the mines operating there.

UNIVERSITY APPOINTMENTS.

The following non-resident lecturers in Highway Engineering for 1911-1912 have been appointed at Columbia University: John A. Bensel, M. Am. Soc. C.E., New York State Engineer, Albany, N.Y.; Walter W. Crosby, M. Am. Soc. C.E., Chief Engineer, Maryland State Roads Commission, Baltimore, Md.; A. W. Dow, Chemical and Consulting Paving Engineer, New York City; Walter H. Fulweiler, Assoc. M. Am. Soc. C.E., Chief Chemist, United Gas Improvement Co., Philadelphia, Pa.; John M. Goodell, Assoc. Am. Soc. C.E., Editor-in-Chief, Engineering Record, New York City; Nelson P. Lewis, M. Am. Soc. C.E., Chief Engineer, Board of Estimate and Apportionment, New York City; Logan W. Page, M. Am. Soc. C.E., Director, United States Office of Public Roads, Washington, D.C.; Harold