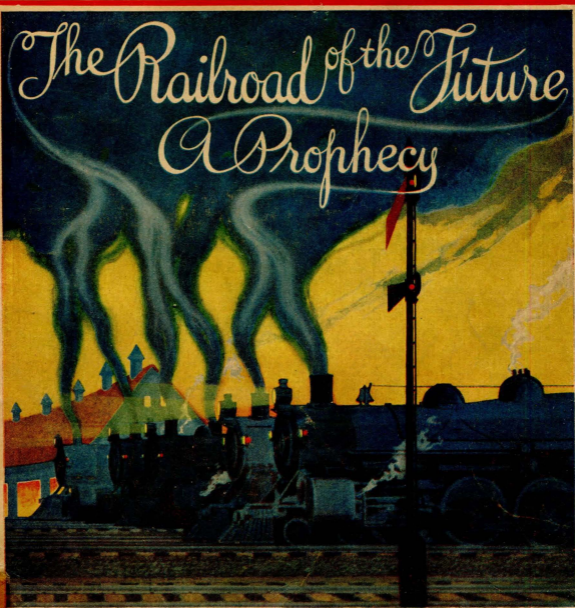


JUNE THE 10 CTS.

RAILROAD MAN'S MAGAZINE

*The Railroad of the Future
A Prophecy*



RAILROAD MAN'S MAGAZINE

CONTENTS FOR JUNE, 1916

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THE RAILROAD OF THE FUTURE.

A Prophetic Vision of America's Progress in A.D. 2416,
as Seen by Warren Noble, Noted
Engineering Authority.

CONSERVATION TO BE THE KEY-NOTE.

Railroads Will Run on Viaducts over Cities, Terminals Being Located in
the Air—Mail to Be Transported in Special Automatic Monorail
Trains—Noiseless Cities, Roofed with Glass—
Aerial Transatlantic Service.

As related by Mr. Noble to

GEORGE ALLAN ENGLAND.



WORLD of miracles and astounding developments, with huge, block-shaped, glass-roofed cities, stupendous viaducts and deep tunnels, with complete mastery of earth, sea, and sky, and with man everywhere absolutely dominating his environment—such is the world that Warren Noble painted before my mental vision, the other day, as we smoked many black cigars and let our imaginations riot all over the universe.

Imaginations? No, I err. Perhaps I did a bit of imagining; but Noble sleuthed facts to their ultimate lairs, dragged them forth, and exhibited them in their last analysis. His mind, keen as a razor-edge, ruthlessly cut down many of my suggestions. Noble is interested only in facts.

That is why his predictions bear more weight than even the most ingenious dreams of the fiction-writer. From the facts of the present he can construct the facts of the future.

Let me paint this fact-world of the year 2416 before your eyes.

We began, of course, with transportation, undoubtedly the greatest material

factor in any civilization. Transportation, then as now, is going to constitute a tremendous problem. Civilization advances only as fast as its methods of transportation advance; the two go hand in hand. In the world of five hundred years from now, all passenger traffic will enter the cities far above the surface and work down, instead of arriving on or below the surface and working up. The railways—for there will still be railways—will be located on the surface only when outside the metropolitan areas.

Aerial Passenger Service.

At some distance from the cities, these lines will soar aloft on huge viaducts. The terminals, as also the aero-line landing-stages, will be on the roofs of the cities—whereof more anon—and from these terminals and stages the passengers will descend to their homes or offices on swift and noiseless elevators or moving inclines. A sufficiently striking idea, is it not, to satisfy Jules Verne, H. G. Wells, or any other prophet?

"How about freight traffic?" I inquired, reaching for another of Noble's excellent smokes.

"That, of course, like all heavy hauling," he answered, as he stretched himself out more at ease on his hotel bed and fixed his eyes on the ceiling, "will continue to be done on the surface. Near the cities it will burrow underground, and then the freight will be brought up from the freight terminals.

"There will never be any chance whatever of aerial freight service. Its cost would be absolutely prohibitive."

We spoke of costs, the prime factor in all mechanical development. Noble does not believe that the cost of freight shipments will be much reduced, if at all. As for passenger traffic, he thinks it will greatly increase in cost; but this cost will be amply justified by increased speed and comfort. Though freight service will always be slow, the methods of distribution will be vastly improved.

One radical change in railroads will be the introduction of tremendously heavier permanent way, with a much wider gage. The six-foot gage will probably come to be a universal standard all over the world, resulting in great economies and improvements of service.

Automatic Monorail Trains for Mail.

"And the monorail?" I suggested.

"Will never be used for freight service, at any rate," he replied. "One trouble with monorails is that the capital expenditure is too high."

I pointed out that stability might be attained, and that monorail cars might ride more easily than the ordinary type, but he countered with the objection that in monorail service the traction is less. Loss of traction spells increase of cost—and that's the answer.

"There may, however," Noble thoughtfully added, "be separate monorail roads, electrically operated and given over exclusively to mail service. I go further; there probably will be such roads. They will doubtless be overhead roads, with automatic trains not operated by engineers, but running under electric control, at—let us say—five-minute intervals.

"Thus there will be no mail delays. The speeds will reach two to three hundred miles an hour, and the trains will consist of groups of cars which can be picked up or dropped, while running, by the 'slip-coach' system already used in England. This slip-coach arrangement,

by the way, will also be employed for the regular passenger service. This will vastly lessen the running time and the consumption of energy, as serious losses of time and energy are caused by stopping and starting at intermediate stations."

Rolling-Stock Will Change But Little.

The ordinary rolling-stock of the railroads of A.D. 2416 will not differ much from that of to-day, save in minor improvements looking toward greater safety and comfort. All traction, of course, will be electric.

Accidents will never be entirely eliminated, but will certainly be reduced to a minimum by increased efficiency and by automatic stopping devices. When an accident does occur, however, at the high speeds of the future—"good night!"

The average speed for passenger service will be about one hundred miles an hour, with possibly some exceptional service even faster. Freight service will not be much more speedy than now, except when handling perishable goods. The farming operations of the distant future will be far more intensified than to-day, and "pick-up" systems will bring farm products to the city with wonderful precision and rapidity.

The passenger and freight trains of the future will continue to be run by engineers, and not automatically, as in the case of mail trains. Of course, under the conditions of speed that seem certain to obtain, two engineers will be employed on every train, with control in duplicate. This idea, of course, is by no means novel. It is likely to be adopted within the next few years, the item of cost being all that even now prohibits its introduction.

Noiseless Cities in the Future.

Where subways are used for freight traffic in cities, these subways will be taken down two or three hundred feet below the present level. The tremendous surface loads of the future will require this to be done, and also the imperative demand for silence.

Everything, in the future, will tend toward silence, as the sensitiveness of the human race increases. Even a century from now noise will be considered a barbarity. Quiet cities, above all, will be a prime necessity of life.

"So, then," I interjected, "in A.D. 2416

the roar of city traffic will no longer be heard?"

"Absolutely not," affirmed Noble. "The logical progress of all mechanism is toward efficiency. Noise means inefficiency in everything."

"Due to lost motion?"

"Precisely. Noise means vibration, which consumes energy. Dissipation of energy, in noise, means lack of energy for useful purposes. It never will be tolerated in the scientific, efficient civilization of five hundred years from now."

I pondered all this, and then put another question:

"How will the swift, heavy trains of that day be controlled in stopping? Will the system of braking be different?"

Braking-System to Be Different.

"Very likely. Of course, friction braking will not disappear, but the control of it is bound to be electrical. Also, friction braking may be supplemented by electrical braking," added the consulting engineer. "That is to say, it can be, and probably will be, effected by the generation of electricity from the kinetic energy of the moving train."

"And might not such electricity be transformed to do some useful work?" I asked.

"It might, but I hardly think it will be. You see, the supply will be too unsteady, too indeterminate; and then again, too, the question of cost militates against any such scheme. The expense of saving, transforming, and storing such electricity would be so great as to make it not worth while."

We passed, by a natural transition, from the subject of railroads to that of water and aerial transportation. The liner of the future, according to Noble, will be vastly larger than anything known to-day, running well up toward four thousand feet or more. It will be perfectly clean above-deck; that is to say, there will be neither masts nor funnels projecting to offer resistance. It will be driven by internal combustion engines; but of this subject let us speak later, under the head of "Power."

Aerial transportation will have become a trite commonplace centuries before 2416. Transatlantic service by aero lines will become a mere matter of course. This development, in fact, already stands on the threshold of the actual.

The planes will be vastly larger than anything we have to-day, and the bodies will be constructed like those of submarines. Interior air-pressure will be maintained in these bodies similar to that of the air at the earth's surface, for the convenience and comfort of the passengers, so that without any difficulty whatsoever the air-ships of the future can travel at altitudes of eight to ten thousand feet. Higher travel than this is not to be anticipated, generally speaking, as it would involve troublesome power problems.

"And how about dirigibles?" I queried.

"Nothing doing!" answered Noble. "They're impracticable for very high speeds. No; planes will do the work, and do it cheaper and better."

"And what will be the average running-time to Europe?"

"About fifteen hours. There will be regular packets every three or four hours to London, Paris, Buenos Aires, and other large cities. Night packets to Europe will be well patronized by those who don't care for the trip and can't afford to lose time.

"Many lines will be established; in fact, the whole globe will be netted with them. Swift passenger planes will be coming and going constantly from every quarter, and mankind will simply forget that such an obstacle as distance ever hampered communication. In those days, of course, there will be no unexplored areas to visit. The entire surface of the earth will be known and mapped. The terrestrial unknown will have absolutely disappeared.

Vast Block-Cities.

"Of course, you understand," Noble continued thoughtfully, "that when I speak of New York, London, Paris, or any other great city of the remote future—and their names will be legion—I have in mind a very different proposition from the weather-exposed, hit-or-miss, noisy, dangerous, and troublesome affairs we call cities to-day. A medieval city was no more insanitary, unscientific, and inconvenient, as compared with one of 1916, than our present cities will seem, in retrospect, to the men of 2416."

"And what will be the main distinguishing features?" I asked.

"Height and the roof."

"So the cities of the future will be vastly taller, and will be enclosed?"

"Precisely," Noble affirmed with con-



WARREN NOBLE, AN ENGINEERING AUTHORITY WHO MAKES SOME REMARKABLE PROPHECIES BASED UPON SCIENTIFIC PROGRESS

fidence. "The necessity for business concentration and for the physical delivery of securities will make land very much more valuable in cities than at present."

"Provided, of course," I objected, "that an entirely different social system doesn't in the mean time completely alter business, as we know it, and substitute collectivism for competition."

"That may happen; but assuming that we still retain competition, then land values will greatly increase, and with this

increase will come a tremendous development of sky-scrapers. Ease of communication will require them to be connected at all floors by means of bridges, and also underground by tunnels.

"These buildings will run up fifteen hundred feet or more; and all of them in one area will be of the same height, not of conflicting heights, as to-day. Of course, the government will far exceed in powers our present government, and will control all building laws. It will regulate heights and other dimensions and specifications. Thus the city of the future will be a vast cube, wonderfully interknit."

"There will be no end of new devices?"

"Naturally. One of the most important will be electric selectors, on which tenants can plug in and thus locate any other tenant at will. Elevators, too, will be vastly improved in speed and efficiency. And that reminds me; do you know that already some two per cent of all power used in transportation is expended vertically?"

I didn't know it, and said so.

"It's a fact," declared Noble. "And this percentage in future is likely to become very much larger. But to return to our muttons—our 2416 sky-scrapers, that is. These huge piles will be far safer and more stable than now; in fact, quite proof against storm, earthquakes, or any natural force, because of being all joined together and also all tied to the roof of the city. Thus they will be supported all the way up, right to the roof."

Glass-Roofed Towns.

"The roof? You really mean to say the cities of the future will be roofed over?"

"Absolutely!" declared Noble, with conviction. "The huge city-cubes will be entirely covered with a glass roof."

"Removable?"

"No; permanent. Arrangements of shades will guard against excessive heat or sunlight. Rain and wet streets will be things of the past, as much as open sewers are with us. Mud, snow, and slush will no longer discommode the men of that era. There will be arrangements for melting snow on the roof and draining it off. And, of course, there will be ventilation by means of huge fans, supplemented by natural drafts, which can be changed according to the direction of the wind.

"Roadways and thoroughfares will be established on the city roof. It seems obvious to me that this will make an ideal place for motoring, and much of the local traffic of the city will be carried there. The glass and steel construction should make an excellent roadbed. The routing of vehicles, of course, will be over the buildings forming the pillars which support the roof.

"As a matter of fact, it is probable that in the city of the far future there will be four or possibly five traffic levels, all connected together both by elevators and also by inclines. Vehicles will pass from level to level by both means as easily as passengers.

"Moving roadways will probably convey them up or down with expedition."

With the assurance of a master-mind which quite clearly foresees the inevitable, Noble sketched in for me some salient features of the cities of 2416. The first requisite will be an absolutely fireproof construction. Conflagrations will have become catastrophes as remote in those days as an incursion of wolves would seem to-day on Fifth Avenue.

Good-by to Fire-Insurance!

Everything will be built of glass and metal. Wood will be entirely discarded. Even furniture will be metallic—no doubt treated by new processes to imitate wood, rattan, and so forth. Other new processes will bring aluminum and magnesium alloys into use for all domestic purposes. It will be a bad era for fire-insurance companies. They will all have gone into the discard long before the year 2416.

Glass, constantly improving, will become almost non-breakable. It will be nearly as durable and tough as metal. Noise, as we have already seen, will be abolished. Pavements will be constructed of some shock-deadening material. Horse traffic will long since have disappeared, thank Heaven! and motor traffic will neither be permitted to honk nor smoke—it will, in fact, be entirely electric. Many streets will have moving pavements and sidewalks, with ingenious transfer-stations where passengers and vehicles can change direction or level.

"How about the railway terminals?" I queried.

Mr. Noble promptly replied:

"Freight will come in through subways

to huge depots and then work upward," answered Noble. "I have already indicated this. Passengers and mails will arrive on the city roof and be distributed downward."

"That is to say, the great passenger terminals, the Grand Centrals of the future, will be on the roof?"

R. R. Stations 1,500 Feet in Air.

"Yes, that is bound to be the arrangement. I repeat my belief that there will be huge railway stations fifteen hundred or more feet aloft, and also vast landing stages for the aerial traffic. Every city roof will be a center for converging lines of traffic.

"Trains will be constantly coming and going at high speeds and with wonderfully quick stops. They will rush over the gigantic spans of the viaducts that will stride 'cross country till they sink to the ground level; and overhead the dwellers of the future will behold swift-speeding air-craft swooping down to rest, or springing aloft for their regulation runs at vast altitudes."

The prospect opened out an inspiring picture to my mental vision. I pondered it a few minutes, then fired another question:

"What will be the motive force of all this tremendous activity?"

"Electricity," answered Noble, "supplemented by internal combustion engines."

"Gas engines?"

"Yes. Of course, coal may have disappeared long before 2416, but that won't make any difference. There will be plenty of gas, nevertheless—gas to burn, so to speak. Ocean-liners, for instance, will be driven by producer-gas engines, making their own gas on board."

"Yes," I put in; "but if the coal is all gone, what source of supply will be available for gas-production?"

"Waste products of the soil. Corn-husks and stalks will be transformed into gas, which will be condensed and stored for use whenever needed."

"You mean, we shall have blocks of solid gas?"

"Practically that. They will be articles of commerce then as much as bricks are now. Of course, I may be wrong about the disappearance of the coal supply. New fields may be discovered, especially

at the poles, which will indefinitely continue the output.

"In that event, power-plants will be established at the mines, running with engines that burn the coal-dust itself to produce power, instead of burning the coal to make steam in the present wasteful manner. This power will be transformed into electricity, and will be transmitted long distances at a very high voltage, probably as high as two hundred thousand volts."

We passed to the subject of ship-propulsion. For a long time I have cherished a pet project of my own—ships built with long tubes lengthwise below the water-line, in which tubes Archimedean screws, swiftly revolving, would (in my imagination) propel the ships at dizzy speeds. Noble, with a bland smile, very promptly knocked my idea into a cocked hat.

"The plan has innumerable objections," said he. "No; the ship-propulsion of the future will continue to be, as now, by means of regulation screws. Nothing better can be devised. The screw is an ideal mechanical device for applying thrust to water. But the screws of the future will all be driven by high-power turbines.

Turbine Ships for Export Freight.

"I do not look for any wonderful gain in speed, as that would mean a tremendous increase in cost. Resistance increases roughly as the cube of the speed, you see. But turbine engines will afford great economies of space for freight—and nothing but freight will be carried on the ships of A.D. 2416. All passenger traffic, of course—or nearly all—will be aerial."

According to Noble, the matter of coal exhaustion is, after all, of minor importance. The natural resources of the world, in the shape of water-power, will never fail to meet every demand for power-production. Tide-motors and air-motors will play but a minor part; water-power alone will suffice for every need. The direct energy of the world's water supply, falling from the water-sheds to the ocean, will be adequate for every purpose of lighting and transportation.

For some time I have been nursing another pet idea—the wireless transmission of power. Noble, however, destroyed my hope in a jiffy.

"Nothing to that!" he decisively exclaimed. "I see no chance whatever of such transmission of electrical energy be-

coming a commercially practicable fact. It would be too costly, as its efficiency must of necessity be very low. Then again, if energy were universally distributed through space, there would be no way of protecting the rights of the legitimate consumers as against the incursions of power-thieves. All kinds of people would 'cut in' and steal power—and there you are."

"Yes; but wouldn't power be free to all, under the conditions of the year 2416?"

Wireless Power Transmission a Dream.

"No. Taxation could never be so adjusted as to make such an arrangement fair to all. One man might use a million horse-power, while another might use only ten. Of course, such men could be proportionally taxed; but how about the 'wireless-tappers' who would steal power and evade taxes? No; the wireless transmission of power for commercial uses is highly improbable."

This suggested an idea. I asked:

"Something the same objection might be put up against wireless telephony. Would it not destroy privacy?"

"It surely would," answered Noble. "And for that exact reason I don't look for any very extensive development of it for a community system. The wireless telephone for general use, like the wireless transmission of power that our futurist novelists like to talk about, will be more honored in the breach than in the observance five hundred years from now."

Universal Communication.

I granted that wireless telephony and power transmission wouldn't work, provided private ownership still persists in the year 2416—which I don't believe it will. This led to a discussion of wire-transmitted speech. And here Noble was enthusiastically certain vast improvements would be made. Just in passing, I must say that Noble is no dreamer, but a doer. Any novelist can spin loftier air-castles and evolve greater wonders than he on paper; but Noble's ideas are built on logical foundations. That's what makes his account of the future civilization so interesting.

However, I digress. To resume:

"So, then, there will be tremendous improvements in telephony?"

"There surely will. Greatly perfected connections will do away with all vexatious delays. Telephoning will be as easy, simple, and direct as personal speech. Delays are to-day caused not so much at the switch-boards as by the 'tie-up' of wires. We shall have multiple systems, and also telephone circuits capable of handling a greater number of variations.

"Several messages will travel over the same wire at the same time, going in the same or in opposite directions. There will be no conflict of messages. Of course, all wires will be placed underground, in conduits, safely removed from weather interference. Messages will be selected out and properly delivered. There will be no danger of Jack's message to Sally being overheard, for instance, by Margaret. Another thing you want to remember, long-distance transmission at special, high rates will entirely disappear."

"How so?"

"There will be a universal rate all over the world. Just as a two-cent stamp to-day carries a letter to Hoboken or to Alaska for the same price, so in the year 2416 you can telephone Hong-Kong as cheaply as you can Yonkers."

"Hong-Kong?" I queried in some surprise. "You mean that there will be telephone communication all over the world?"

Can Phone around the World Then.

"Precisely that," affirmed Noble, aiming an arrow of smoke at the chandelier. "In those days you can call up Tibet 2345 or Patagonia 6789 just as quickly and easily—and as cheaply, too—as you now call up the RAILROAD MAN'S MAGAZINE. This universal system, like the telegraph system of the world, will be owned by the governments of the different countries. All these governments will pay subsidies to these systems."

I, as a socialist, took heart at this prophecy. I immediately edged in with a leading question:

"And will the service be free?"

"I hardly think so. No; the subscribers will still have to pay, though the rate will be low. Incidentally, every room of every house, in those days, will be fitted with a telephone. The telephone will be as much a matter of course then as windows are to-day.

"And that reminds me of something I meant to say when we were discussing city-

building. Every community will have garbage-conveyors, like sewers, to carry all garbage to central stations, where it will be used for generating producer-gas for light and power. The gas produced by a city's garbage will drive electric-lighting plants. Thus the community's waste products of all kinds will help keep the community well lighted at a minimum cost. To-day we tow our garbage out to sea and dump it—a total waste of great resources. The civilization of the future will be wiser than that and more sanely economical."

Abolishing Night.

"Good idea," said I. "All lighting will be electric?"

"Yes, using some kind of electric vacuum system. The lighting tubes will be installed along the cornices of buildings and rooms, and will give indirect light from invisible sources. Great increases of efficiency in lighting devices will enable us to use nothing but the indirect system—far superior to the direct and much less trying to the eyes.

"There will also be luminous walls and streets. Pavements, sidewalks, walls, and everything may be made to glow. And this light will be entirely cold."

"A more economical form?"

"Yes," answered Noble. "More energy will be used for light and less for heat—practically none at all for heat in the lighting systems. The city dweller will always have plenty of light. Work can be carried on right through the twenty-four hours. Life, in fact, will probably cease to differentiate day and night to a considerable extent."

"You mean that in the cities of the future there will be no bad weather, no rain, snow, mud, cold, or darkness?"

The scientist nodded.

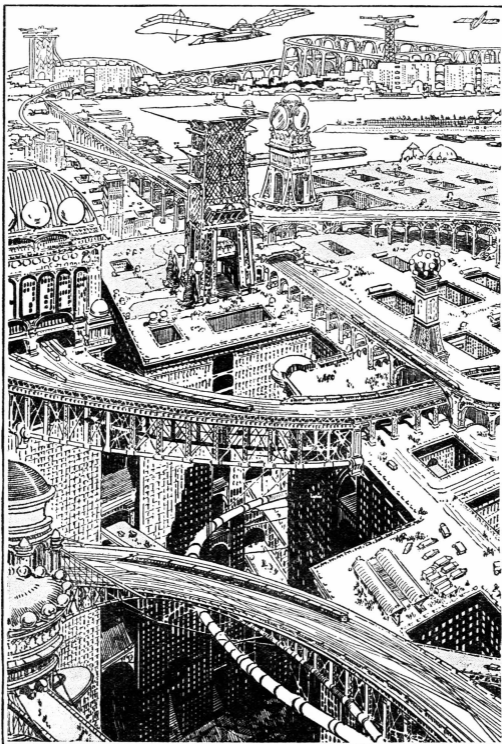
"No night at all?"

"No night."

No Universal Language.

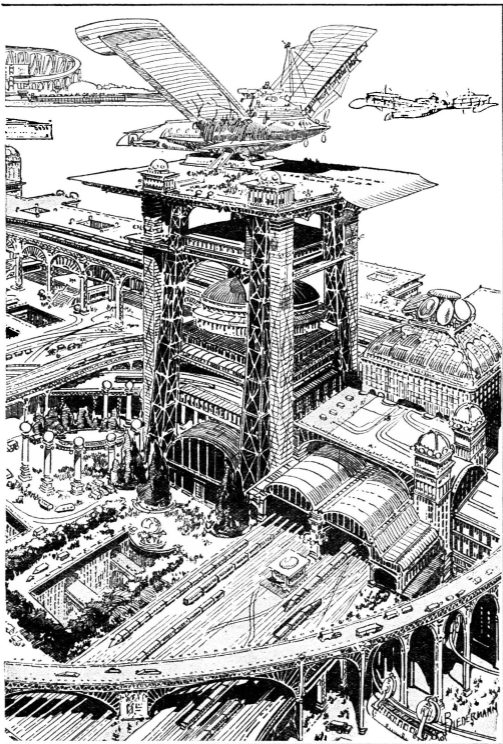
"What," I asked, "will be the effect of all these strange innovations on the human race? For instance, will universal telephony introduce a universal language? And will the extension of machinery enfeeble mankind? And will—"

"Hold on! One thing at a time!" Noble interrupted, smiling with amusement. "In regard to the universal lan-



SUCH A VIEW OF A GIGANTIC FUTURE METROPOLIS MAY APPEAR FANTASTIC—

"ALL PASSENGER-TRAFFIC WILL ENTER ON HUGE VIADUCTS. THE TERMINALS, AS ALSO THE AERO-LINE LANDING-STAGES, WILL BE ON THE ROOFS."



—BUT IT IS CLEARLY FORESHADOWED BY OUR PRESENT SCIENTIFIC ADVANCE.

"FREIGHT-TRAFFIC WILL CONTINUE TO MOVE ON THE SURFACE. NEAR CITIES IT WILL BURROW UNDERGROUND AND THE GOODS WILL BE HOISTED TO THE STREET LEVEL."

guage proposition, no, I don't take any stock in that. I don't expect to see Esperanto drive the great modern languages into the discard. They will persist, just as the principal races will persist, indefinitely.

"I hardly think there will be a world federation of nations, except possibly for trade purposes or communication, or something of that sort; certainly no central world government, with the various nations as states in the league. All the larger nations of to-day will be extant in 2416.

"If any language at all takes precedence, it will undoubtedly be English, because that seems the best tongue for business purposes; and business efficiency, brevity, 'pep,' will be the order of the day."

"Now," I queried, "as regards the physical characteristics of mankind, will the superior civilization of that age weaken the human race?"

"That is hard to say. One thing seems certain: there will always be the necessity for a certain amount of hand labor. That can never be totally eliminated, though all laborious tasks will be rendered more facile. In the building trades, in excavating and the like, men must always use their muscles. Still, in many lines of work, physical exertion is bound to be greatly diminished."

"So then," I suggested, "people will have to take exercise voluntarily to keep from degenerating?"

"It looks that way. As our knowledge of natural forces increases, the necessity of walking—for instance—will diminish. Men will have more leisure for exercise, which will be taken under ideal conditions.

Natural Forces Will Diminish Exercise.

"Every city will have public exercise-halls, or parks, or something of that sort, with health-giving, disease-destroying rays constantly shining there. These will be open to the public, free of charge; everybody can go there for exercise and rest. The light-rays, or electric vibrations, or whatever they may be, will destroy micro-organisms, repair bodily damage, and stimulate growth.

"Less exercise, under these conditions, will be required for the same effect than is now required. In other words, natural forces will give us a kind of superior, ar-

tificial existence. You can bathe in health-emanations—turn on the switch and watch your muscles grow, or get rid of rheumatism or anything you please."

"Fine!" I approved. "That would just suit me. Your conclusion, then, is that the men of five hundred years hence will still be strong and active?"

"I believe so. The race of the future will conserve its energies for useful purposes only. Waste of human resources or human life will be the great crime of crimes. Men will be very busy, I think; only the busy man of then will be a totally different kind of busy man from that of to-day. Intellect will be exalted. And if certain pathological discoveries are pursued, there is every reason to believe that practically all diseases will be wiped out, the period of life greatly extended, and the vigor of youth remain unimpaired from early years until a very advanced age."

Infinite Progress.

"And will there be no end to the process of race-improvement and world-betterment?" I asked.

"None," affirmed Noble.

"Personally, I believe the time must come when nothing more can be thought of to invent and no more improvements can be made; in short, when men will stop inventing because everything has been invented."

Noble smiled and shook his head in negation.

"I think you're wrong," he answered. "That's not borne out by the facts. Men a hundred years ago thought they could see the end of the process, but they hadn't an inkling of the twentieth century. To-day we stand merely on the edge of achievement. No, there will never be an end of improvement. New processes, new devices, new ways of doing everything—it's endless.

"All human progress, in material ways, works along the lines of reducing waste and increasing simplicity and efficiency. I see no termination of that process."

Noble glanced at his watch, sat up, and reached for his hat.

"Excuse me, but I must be going," said he. "Delving into the world of 2416, I'm late already for an appointment in the year 1916." Thus abruptly we left the epoch of five hundred years from now and returned to the present.