# KNOW YOURSELF

by NATHANIEL GUBBINS
from London Daily Express.

Old Moore Gubbins, the world-famous astrologer, has frequently offered his inaccurate forecasts of future events to the credulous public. This week he will tag along behind more successful astrologers who earn a crust or bread describing your character according to the month of your birth.

Unlike most astrologers, who write mainly to please women, this is written to annoy everybody—men, women, and children.

* * *

**Dec. 20.... .... .... Jan. 20**

If you were born in this period you are mean, grasping, cagey, and cunning.

At school you will be hated because you are a natural sneak.

You will also cheat at exams, and games because your greedy eye will be fixed on the prize rather than achievement for its own sake.

You will be successful in business, so long as it is dirty business. You would also succeed in politics.

So far, club committees have not studied astrology. When they do, they will blackball all people born in January. This will save a lot of resignations by other members, who will find January-born people rude, boorish, vain, and tight-fisted.

If you are a January-born man your wife will hate you. If you are a January-born woman your husband will hate you. If you were both born in January, your children will be devils, born with hooves and tails.

When you were born, the sun was passing through the sign of the Zodiac called Capricorn, the Goat.

And you January people have one thing in common with goats. You stink.

**Jan. 21.....Feb. 19**

February people are nothing but pests. They are restless, vain, self-centred boors, always worrying themselves and other people about their health, talking rubbish about things they don't understand, joining societies and yapping about politics and religion without the vaguest knowledge of either.

You can't tell them anything. They know. They think they have advanced ideas and believe themselves to be "modern," whereas they are more conventional than most people and usually have no ideas at all unless they acquired them from somebody else.

February women, particularly, are obsessed with this idea of being modern, always terretting that Eve, in her time, was "modern"—more modern and daring than the majority of her descendants.

Although February people believe they will succeed at anything, they usually succeed at nothing, unless somebody kicks them up behind.

In fact, this is the best thing to do with them. When you know them better, it will give you a great deal of satisfaction.

**Feb 20..... Maz. 20**

What a cocky, domineering lot you are. Like the February people, you know everything, too. And heaven help anybody who upsets your vanity.

You also believe you can do anything better than anybody else. Failure after failure won't make any difference to your self-esteem. You will always think it is somebody else's fault.

Nevertheless, you will succeed, even if it is only by trampling on somebody else. If a man, you would make a good, if unpopular, sergeant-major; if a woman, a good and extremely unpopular matron of a hospital.

Whatever you do you will be unpopular. As your Zodical sign, Pisces, is represented by two fishes, which means you are fond of water, why don't you go and drown yourself?

**March 21. . . .April 21**

Hitler was born during this period, so most of you can consider yourselves half, or wholly, mad.

But yours is not the foolish, irresponsible madness which many young people affect in the hope that somebody will mistake it for genius.

Yours is the madness of the fixed idea, the passion to impose your views on others, the determination to reach your objective at any cost—to other people.

You like freedom for yourself: serfdom for the rest. You believe in keeping the lower classes in their proper place. If you happen to belong to this class yourself you will always find somebody a little lower to oppress.

You were a horrid little boy. You were also a horrid little girl. You kicked little boys who touched your engine. You scratched little girls who nursed your doll.

You are even more horrible now you are grown up. The sooner you are certified and safe under lock and key, the better.

**April 21. . . . .May 20**

Lazy but lucky is the best way to describe May-born people.

The men are usually bar flies. The women are usually sluts. In fact, both sexes would be natural born spivs if they had any brains for buying and selling. As it is, they lounge through life waiting for somebody to look after them.

And as they are born lucky, some hard-working wretch usually does.

Although born under the sign of Venus, you are not necessarily beautiful. In fact, you are inclined to fat and not very funny stories. You would make good barmaids if you were not such good bar flies, good publicity agents if you knew some funnier stories.

You will probably live to a great age, because you don't worry. You have no brains to worry with.

**May 21.....June 20**

You were born under the sign of Gemini, The Twins, which means you have a dual personality. This is only a polite way of saying you are a double-crosser and a first-class liar.

You are every bit as lazy as the May-born people, but you are not quite so dumb.

In fact, your mind is too quick for most people. You have talked them into something before they know where they are, unless you're trying it on somebody of your own type.

I daresay most spivs were born in this period.

Superficial knowledge is one of your assets in making friendships. Although you are too indolent to acquire real knowledge, you can talk plausibly about anything under the sun. As a crooked auctioneer you would be a great success.

Women are advised not to marry Geminis. They get bored easily, are not interested in anybody but themselves, are inclined to drink too much, and are hardly ever faithful.

Although they have two personalities, they are both unpleasant.

**June 21.....July 23**

A born sucker, eh? Loyal decent, dumb reliable, fond of your family, always imposed upon, honest, truthful—what a mess you are.

What hopes have you of getting on in this world, though you may be O. K. in the next?

In fact, your personality is so dull I can't waste any more space on it except to advise you never to invest your money if you are a man. If a woman, never speak to strangers.

A real astrologer writes of your type. "You will do well in all callings connected with liquids."

This does not necessarily mean you would make a first-class admiral. it is more likely to mean you would make a second-rate potman.

**July 24.....August 23**

So. Here comes the greatlover, eh? if a woman, a vamp; if a man, one of those people you never invite home the second time.

Also a bit of a political extremist, too? A frothing Fascist or a scheming Communist?

I think I can see you. Fond of good living and finery, argumentative aggressive, selfish and greedy.

Keep out of my way, will you?

**August 24.....Sept. 23**

Just a fusspot, aren't you? Fussy and bossy. Tidy and tyrannical. Worrying about your inside and other people's insides. Never really happy unless somebody is ill and you can fuss over them.

From your crowd come the civil servants, the unadventurous respecters of law and order.

Nothing much to say about dull, sane people like you except to advise you to stop talking about your operation.

**Sept. 24.....Oct. 23**

Another dull lot. The women are shy and homely (in both senses of the word), and are given to sitting around clicking knitting needles and asking silly questions.

The men are much the same except that they can't knit.

**Oct. 24.....Nov. 22**

According to this real astrologer I have been reading, some of the greatest people in the world have been born in this period.

But don't let this go to your head. You are cocky enough as it is. Remember that millions born under this sign have never done anything much but poke their noses into other people's business.

That is why you make such good policemen. Hiya flatfoot.

**Nov. 23.....Dec. 23**

I've been right round the year without finding anybody who doesn't seem to be either a fool or a natural-born basket.

So I'll try to say something nice about you even if it is only to maintain some faith in the human race.

Again, according to this real astrologer, you're not a bad sort, anyway.

Like the June-born people, you have a dual personality, the same quick mind, the same easy friendships, maybe the same taste for liquor.

The women are described as bright being, cheerful in adversity, the men as outdoor, sporty types, given to making puns.

A pity.

# Biographical Notes on F.J. Sanger

**Chartered Civil and Mechanical Engineer.**

Born in 1905 in Hampshire, England. Educated Government, and private secondary, schools. 1921 entered Royal Dockyard, Portsmouth as Indentured Shipwright Apprentice, three years on steel construction with working parties, one year in Drawing Office. Four years in Dockyard School studying Naval Architecture and allied subjects. 1925 Won Royal Scholarship in Engineering, Kitchener Memorial Scholarship, Elgar Scholarship in Naval Architecture and went to London University, Imperial College of Science and Technology with the first two scholarships to study Civil Engineering. In vacations worked as Shipwright in Portsmouth Dockyard and Draughtsman with Consulting Civil Engineers. Awarded Associateship of City and Guilds Institute in Civil Engineering, on completion of undergraduate course in 1927. Studied one year postgraduate in the Imperial College, majoring in "Hydro-Electric Engineering "with" Reinforced Concrete Design," Economic Geology" etc. as minor subjects. Awarded Diploma of the Imperial College in 1928. Also graduated in London University with B.Sc. (Eng.) London degree, with 1st class Honours.

After leaving college in 1928, worked for a year with Messrs. Christiani and Nielsen London office) as Reinforced Concrete Designer and estimator.

In 1929 joined the Royal Air Force as Education Officer, with rank of Flight-Lieutenant, for technical training of aircraftmen. Served five years, mainly with aero-engine fitters, teaching "Drawing," "Internal Combustion Theory," "Mechanics of Flight," etc. 1934 elected Associate Fellow, Royal Aeronautical Society.

In 1934 went to Shanghai, China, as Head of the Department of Engineering and Building in a new Technical College—the Henry Lester Institute of Technical Education. (Post corresponding to Dean of Engineering and Building in Universities). Planned all courses from the beginning. Designed heat engines and hydraulics, electrical power laboratories. Two day-courses of University standing—"Mechanical Engineering" and "Civil Engineering and Building." Sixty Freshmen each year. Evening courses in many technological subjects with augmented local staff. Institute recognized by London University and Matriculated students took the London B.Sc. (Eng) External examinations conducted in Shanghai by the British Consulate representing the University. Lecturing mainly in "Materials," "Applied Thermodynamics" and "Fluid Mechanics" (all subjects including laboratory classes.) Considerable commercial testing of steel, aluminum, concrete and other materials. Consulting work mainly in materials, but also in other local problems. Research in Soil Mechanics and Foundations from 1937 to 1942 (part-time only). Member and Member of Council of the Engineering Society of China and member of several Committees. Hon. Sec. and Treasurer of the Foundations Research Committee of the Society. Member of the Royal Asiatic Society. Lectures and publications in Shanghai—1936 Recent Developments in Internal Combustion Engines (Eng. Soc. China) 1939 Three papers on Soil Mechanics (Eng. Soc. China), 1939 (with collaborator) Models in Engineering. (Eng. Soc. China and Inst. C. E.) 1938. M.Sc. (Eng) Lond., on Foundations Reseahch. 1941 Inst. C. E. paper on the Design of Engineering Laboratories in the Henry Lester Institute. 1946 Special Report on the Field Research on Field Foundations in Shanghai (Private circulation only). 1941 Natural Flight (Royal Asiatic Society). 1941 elected Associate Member of the Institution of Mechanical Engineers and Member of Committee of China Branch of the Institution. Also member of the Federation of British Industries' Apprenticeship Committee, China. In 1937 elected Associate Member of the American Society of Civiy Engineers and full Member in 1941. 1941-'46 elected Associate Member Institution of Civil Engineers (membership delayed by the War).

On outbreak of war in 1939 volunteered for Government Service but was asked to work in the Institute. Lectured and broadcast on the R.A.F. Served in Inventions Committee in Shanghai. Interviewed applicants for commissions in Technical Branches of the Services. 1941: Japanese took over the Institute which continued to operate until 1942 when British staff was evicted. Then joined voluntary society, looking after British interests, in the Relief Section, later as Organizer and Director of the Civil Assembly Office formed to assist British Nationals ordered to internment camps by the Japanese. Interned at Lunghua in 1943. Labour officer in camp of 1,800 persons, men, women and children. Councillor and Executive. Lecturer and school teacher. External examiner etc. Chairman of Technical Committee. Organizer of Rebilleting and of Air Raid Precautions. Gave 12 public lectures and organized others. Repatriated 1945.

In England in 1943 prepared the final report on the research work of the Foundations Research Committee and recuperated from internment. In October appointed Professor and Head of the newly-created Drawing Department of University of New Brunswick and arrived in Canada in January, 1947.

In the spring of 1947 became Member of the American Society for Engineering Education and Member of the Canadian Institute of International Affairs.

Married in 1928 and has three children, a daughter studying in the University and a younger son and daughter. (Family in New Zealand during war).

Has travelled in China from Hong Kong to Dairen and in Japan, and resided in Shanghai for 11 years. Shanghai Golf Club, Shanghai Cricket Club (Club scorer) the Columbia Country Club, and the Public Health Club of Shanghai.

F. J. SANGER, Professor.
16|2|48





# RADAR

## by Prof. J.O.Dineen

Radar is a term coined from the descriptive phrase "radio detection and ranging." It is an addition to man's sensory equipment which affords genuinely new facilities. It enables a certain class of objects to be "seen,"—that is, detected and located,—at distances far beyond those at which they could be distinguished by the unaided eye. This "seeing" is unimpaired by darkness, fog, cloud, smoke, and most of the other obstacles to ordinary vision. Radar also permits the measurement of the range of the object it "sees" with a convenience and precision entirely unknown in the past. It can also measure the speed of an object moving relative to the observing station.

In some respects radar is inferior to the eye. It is poor on detail and shows only the gross outline of an object. Radar is at its best in dealing with isolated targets in a relatively featureless background, such as aircraft in the air or ships on the sea. Though modern high-definition radar does afford a fairly detailed presentation of such a complex target as a city, viewed from the air, the radar picture of such a target is incomparably poorer in detail than a vertical photograph taken under favorable conditions.

Radar works by sending out radio waves from a transmitter of sufficient power that measurable amounts of radio energy will be reflected from the objects to be seen by the radar, to a radio receiver which is usually located at the same site as the transmitter. The properties of the received echoes are used to form a picture or to determine certain properties of the objects that cause the echoes. The transmitter may send out CW signals, or signals modulated in a number of different ways. Of all the types, that which is most highly developed is pulse radar. This rapid growth came about because of the military necessity of World War II.

In pulse radar, the transmitter is modulated in such a way that it sends out very intense, very brief pulses of radio energy at intervals that are spaced rather far apart in terms of the duration of a pulse. During the waiting time of the transmitter between the pulses, the receiver is active. Echoes are received from the nearest objects soon after the transmission of the pulse, from objects farther away at a slightly later time, and so on. When sufficient time has elapsed for the reception of echoes from the most distant objects of interest, the transmitter is keyed again to send another very short pulse, and the cycle repeats. Since the radio waves used in radar are propagated with the speed of light, C, the time delay, T, between the transmission of a pulse and the reception of the echo from an object at range R will be $T=2R \div C$ seconds. Hence range measurement is reduced to the measurement of time. Modern electronic timing and display techniques have been developed to such a point that a time interval of one-thirtieth of a microsecond, which corresponds to a range precision of 5 yards, can be readily measured.

In addition to range, it is desirable to know the direction from which an echo is coming. This has been made possible by the development of radio techniques on wavelengths short enough to permit the use of highly directional antennas, so that a more or less sharp beam of radiation could be produced by by an antenna of reasonable physical size. When the pulses are sent in such a beam, echoes will be received only from targets that lie in the direction the beam is pointing. If the antenna, and hence the Radar beam is swept or scanned around the horizon, the strangest echo will be received from each target when the beam is pointing directly toward the target. Thus, the bearing of a target will be given when the strongest echo signal is received from it.

The Plan-position-indicator or PPI is a cathode-ray type receiver which displays simultaneously range and azimuth data in such a way that the screen looks like a map with the observing station at its centre.

The development of radar has led to the use of ever higher frequencies and shorter wavelengths. In the range shorter than 30 cm. wavelength, we have what is called micro-wave radar. The superiority of microwave radar arises largely because of the desirability of focusing radar energy into sharp beams, so that the direction as well as the range of targets can be determined. In accordance with physical laws, for an antenna of a given size, the breadth of the beam produced is proportional to wavelength. Particularly in the case of airborne radar, where a large antenna cannot be tolerated for aerodynamic reasons, a small antenna is required and hence microwaves must be used.

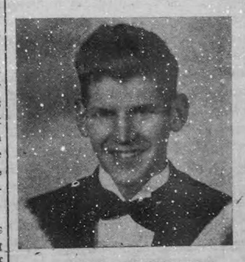
The principle of pulse ranging which characterizes modern radar was first used in America in 1925 for measuring the height of the ionosphere. Following this, pulse radar systems were developed by most of the European countries, including England and Germany during the 1930's. By 1938 a chain of radar stations was in operation in southern Engand. The greatest impetus to the development of modern radar was given by the development in England of a powerful generator of microwave energy, known as the multi-cavity magnetron. This was placed in the hands of American industry and phenomenal development followed. In time and money spent, radar came second in importance to the Atomic bomb during the recent war. Already it is serving many useful purposes in its peacetime role. It is the basis of Ground-Controlled approach, a highly accurate method of blind-landing for aircraft now in use at all the major airports. It is also providing much valuable information to the meteorologists in the detection and observance of approaching storms. It is found on all airlines as an aid to navigation and is finding similar use on steamships. Only the future and the inexhaustible ingenuity of the mind of man will determine its development.

Prof. J. O. DINEEN

# NEW ENGINEERING PROFESSORS

ALBERT STEVENS.

Albert Stevens is well known on the campus, having graduated in Civil last year. This year as assistant prof. he is in charge of testing materials and was a prominent member of the Engineering Society, one of his successful undertakings being Stores Manager. We know he will continue to be a strong supporter of our society.



LLOYD HARGROVE

Lloyd has come to the faculty after a year with CFBC in Saint John. He is a UNB'er of the '46 class when he made a showing in Electrical. The University Radio Club is fortunate to have him as a member, his keenness is further pronounced by the fact that he has his own Amateur Station, known on the air as VE1PO.

ELLIS CUNNINGHAM

We are pleased to have Ellis Cunningham with us and is doing a swell job in the new machine design shop lab. Before coming to UNB he was with the Department of Education on Wartime Training at Moncton. He is well known and popular in the engineering building and some know him from his college days at UNB in '31. Ellis is living on the Woodstock Road in his recently completed home.

# MONORAILS

## by JOHN BUSBY

*An Old Transportation System Offers a New Challenge to Free Enterprises—*

Engineers who lament having missed the dramatic days of railroad construction may discover that they are in time to see an exciting new chapter added to the story of rail transportation.

You may ask—"What is this idea and how will it speed up rail service? The answer is MONORAIL. One rail instead of the conventional two. Once constructed this system can combine the speed of the airliner with the safety, comfort and economy. In case this appears too visionary we'd like to point out that Europe has been using railroads of this type for a good many years.

The Germans built a high speed line 45 years ago. When figures were last available, they showed it had carried half a million at speeds in excess of 125 MPH. If this doesn't impress you, then the safety record will. The system at that time had not had one fatal accident involving either passenger or employee in all the years of its existence.

The proponents of Moncrail, who include some of the leading engineers and transportation authorities in the country, agree that it has many advantages not offered by other forms of transportation. Two outstanding points in favor of this system are the high speeds obtainable and the separation of grade which keeps these speeds consistant and safe regardless of the condition of surface traffic.

In other words, the Monorail would be supported on standards that would provide sufficient elevation to keep the streamlined cars safely above the tops of steel vehicles.

Comparison to the old and huge steel-shadowing structures which were so characteristic of the old elevators, will stop immediately when we realize that Monorail operation is neat and noiseless.

In the U. S A. one of the first Monorails to be built was constructed for the transportation of heavy oil-drilling equipment over six miles of heavy mud. The only roadbed necessary was an A-shaped frame resembling a fence, 10 feet high

Connecting these frames was a stringer which, in turn, supported the single rail.

A few years after the first monorail effort, a new line spring up, running in the section of land now called Brooklyn where a Mr. Boynton succeeded in running a locomotive on a single rail. The locomotive was, perhaps, the strangest part of this early monorail. It consisted of a single driving wheel, eight feet in diameter and a two-storey cab which housed the engineer on the top deck with the fireman shovelled coal downstairs.

In 1900, Brennan, an Irishman laid a single rail on the ground using the conventional rail and cross-tie type of gyroscopes kept his 40-foot cars on an even keel, attaining speeds up to 125 MPH. There was only one difficulty—the whining gyroscopes were too persistent in keeping the cars in a vertical position and when the track curved, the train didn't.

In 1901 the Germans successfully operated the Elberfeld line—the first which proved the advantages of monorail to the engineering world.

To get into more technical language:—As the amount of banking is automatically controlled by centrifugal force, curves can be negotiated at eighty or ninety MPH. The correct amount of lean is present, so regardless of speed, a glass of water filled to the brim will undergo the wildest ride without spilling.

An industrial-type train operated for six weeks with a rock balanced on a cross-piece This remarkably smooth ride, even for a monorail freight train, is due to the absence of side-sway; the vibration caused by flounge-grip is also non-existent. The resultant decrease in friction means a 70% reduction in operating costs.

Monorail is highly practical and soundly engineered.

Improvements of public transportation have not been one of the major advancements of our age. In fact we have slipped backwards. The popular interurban electrics which provided swift and pleasant travel have virtually disappeared from among the ranks of our transports. Busses have been substituted. The overloading of surface transportation has slowed down commuted traffic and has increased accident votes.

Demands for better and speedier transport had been answered in part by the interurban railway but it had its disadvantages. Elevated and underground railways have alleviated the situation also but their cost is a great disadvantage. Such grade separations do provide fast train service with freedom of right-of-way BUT—it costs from $869,600 to $1,118,000 for a single-track mile of elevated, $3,000,000 to $11,000,000 for a single-bore mile of subway. And this does not include equipment.

What about the suspended monorail? The bill for this system is estimated at $300,000 per double track mile, including stations and rolling stock.

The industrial applications of the monorail are manifold. As an example, a California Salt Company's mono, system operates small trains each carrying 6,000 lbs. of salt over a 10% grade at 20 MPH. with only 2½ HP driving power.

Monorail would mean the elimination of bridges and a much higher gradient would be of needs used. It could make long strides over hills and canyons. Reduced to its simplest form, the industrial line would still have the same speed, safety and efficiency offered by its city cousins.

This monorail is undoubtedly one of the most exciting challenges to free enterprise in many years.

RAILROAD MAGAZINE
of September, 1947.

*SWISS CENTENNIAL.*