

Stanford Observed

The Military-Industrial Park

Prof. Mr. Ransom
Stanford & A&E

By David Ransom

ONCE BEAUTIFUL SANTA CLARA VALLEY (as the publicists are wont to call it) has become a place where the military-industrial complex, with its university annex, is putting tanks on the coast and money in the bank. Not only healthy war footing of age in the American Military Economy, Vietnam demands its researchers to develop weapons, its industries to manufacture them, and its trained young men to put them to use.

Not surprisingly, Stanford University ("The Camp") provides all three. From a labor pool of thousands of "minds in training," it rises through amalgam of scientists and engineers, to the elite and powerful Trustees, master sergeants of industry and corporate special forces in the war effort.

Stanford is a woman of easy virtue, and if the Trustees have their way, she will lose even that.

It should come as no surprise that the scientific-corporate complex encompassing Stanford, Stanford Research Institute, Stanford Industrial Park, and the corporations controlled by Stanford's

Trustees and the SRI Board of Directors (to whom the Trustees appoint), is up to its neck in war, that it has developed and manufactured the gascan in use in Vietnam, most of the military vehicles in use in Vietnam, most of the aircraft in use in Vietnam, much of the ordnance in use in Vietnam, and has even laid out the plans (still in use) for human incineration by concentration camp.

"We have been pioneers in creating a new type of community," says Fred Terman, Vice-President and Provost Emeritus, and a past director of SRI, "a community of technical scholars... composed of industries utilizing highly sophisticated technology, together with a strong university that is sensitive to the creative activities of the surrounding industry."

Terman, besides being still a consultant to President Sterling, is a director of Granger Associates, a firm in the Industrial Park specializing in the design and manufacture of electronic communications equipment. So far as I can make out nearly two-thirds of Granger's business in 1966 was military—and business was up. Among this was a research and development ("R&D") contract concerning the Boeing KC-135 Stratotanker,

Who designs equipment for F-105's?

Stanford Industrial Park

the plane that refuels F-105's on their way to or from North Vietnam.

Joining Terman over North Vietnam are David Packard, recipient of the Stanford Distinguished Alumnus Award this year (or was it Hewlett?) and Allen Peterson, Professor of Electrical Engineering and Assistant Director of the Electronics and Radiolocation Division of SRI—both on the board of directors at Granger.

Packard, of course, is both a Stanford Trustee and a director of SRI. With Bill Hewlett, also a Trustee, he founded Hewlett-Packard, also in the Industrial Park, on the board of which we find four other Stanford men: two other Trustees (one of which is also a director of SRI), as well as Ernest Arbuckle, Dean of the Business School and Chairman of the Board of SRI, and the good Mr. Terman again.

Hewlett-Packard makes basic electronics equipment, only about \$4 million worth of which was prime contracts that went directly to the armed forces last year, but much of which goes to other arms manufacturers.

Hewlett and Terman sit together as (Cont. p.B, col. 1)



SRI did R&D on this part



Charles Uiccom
Was it a Lockheed plane?

Editorial

This supplement is the first in a series of publications which will deal with Stanford University's participation in the military-industrial complex. In the last issue of Commitment, we outlined the major ways in which Stanford has successfully sought to engage itself in war industry. This issue describes the nature and extent of but one notable area of Stanford's involvement.

We do not intend to imply by the term "military-industrial complex" the existence of a conspiracy. Rather, we understand the phenomenon in the way suggested by Robert S. McNamara, as "the steadily increasing cooperation between the Department of Defense and Industry...." As his Department's magazine explains, "Today we depend heavily on industry for the job of weapons-making. The best evidence of this is that defense industry has become a \$25 billion a year business."

We realize, of course, that some of the work supported by war department funds has no direct military application, and is, in some cases, extremely useful and even necessary for the most humane of purposes. Even so, none of us feel that the moral cost of these funds is prohibitive. Our point, however, is simply that the overwhelming bulk of work done for the war department quite naturally contributes to war, and we have shown in this issue that much of the work engaged in by companies in Stanford's Industrial Park contributes in essential ways to the war in Vietnam. Our position is that Stanford Lands should not continue to be used to support mass murder.

We are not so naive as to think that these corporations can be easily, if at all, removed from the Industrial Park, especially in view of the fact that some of their directors are also decision-makers at Stanford, and that most of the other men who run the University are engaged in similar enterprises. We believe, however, that those who oppose the war in Vietnam and the establishment which is pursuing it, must translate their knowledge into action and begin what will undoubtedly be a long hard fight to drive the war establishment out of the University. Success in this effort will not, by itself, end the war or these corporations' contribution to it. What our effort will do, all the while we are working, is provide another sorely needed way of opposing the war, as well as an example for others who feel as we do, that they can and must act—and that the place to begin, in this vast society, is wherever we happen to be at the time.

Ira Arlock

(Cont. from p.A)

directors of Watkins-Johnson, another tenant of the Industrial Park, the president of which, D.A. Watkins, is another Trustee. According to Standard & Poor's, 75% of W-J's sales are for space and defense, and since the expansion of the war in early 1965, its sales and profits have doubled. It prides itself on being "the largest producer of...novel devices which are a key component in a new generation of military search and reconnaissance receiver equipment."

Resistance

Watkins-Johnson is controlled by the Kern County Land Co., on the board of which sit Hewlett, Paul L. Davies (a director of SRI), and Dean Arbuckle again.

Dean Arbuckle is also a director of the Utah Construction and Mining Co., also a tenant of the Industrial Park, and with him on the board are Edmund Littlefield (President of Utah C&M and a Trustee), and A.E. Brandlin, Stanford's Vice-President for Business Affairs and a member of the Faculty Committee on Land Development. Utah C&M makes Air Force bases.

Until October of 1965, Dean Arbuckle was also a director of Varian Associates, one of the original members of the Industrial Park and still a major tenant. Russell Varian, who founded the firm, was himself a Stanford man. In 1963, when Arbuckle was a member of the board, Varian accepted a \$29,000 contract from the U.S. Army Missile Command for the "design and development of an automatic anti-personnel mine dispersal system." What relation this contract has to the anti-personnel "bombs" recently dropped "by mistake on a friendly Montagnard village" I have been unable to discover—"anti-personnel bombs which burst into small clusters which explode at time intervals several minutes apart." (UPI).

Varian also boasts in its advertisements that "our Armed Forces in Southeast Asia and in other corners of the world are now using the AN/TKC-80, originally designed for use with the Pershing Missile System, for point-to-point tactical communications." It also holds a contract for the HAWK missile system and does over \$700,000 in War Department research and development. Before Vietnam's salutary effect on the electronics industry, Varian was laying off workers (as was much of the Industrial Park); but 1966 was its most successful year: sales rose 32%, profits, 93%.

While mounting a diversification program "to lessen the company's reliance upon military procurements" (45% in 1966) "We do not wish to leave the impression...that we intend to restrict our defense business. Indeed, we expect to see growth in this area and we intend always to be responsive to the needs of the nation." [sic].

SRI, of which Arbuckle is Chairman of the Board, replacing Sterling, who is still a director, was created in 1946 by the Board of Trustees, who continue to elect its board of directors. It is a present tenant of the Industrial Park, having taken over in the last year or so a building vacated by Lockheed. In the recent past it has been among the top 100 contractors for the War Department, even though it contracts for nothing other than research and development. During the Korean War the Institute r&d'd anti-tank mines, planting them in abundance in what is now Palo Alto's Foothills Park, and they stayed there until some kids stumbled across one (or dug it up, I forget) in the early '60's.

More recently SRI has had a good deal of money (more than \$4 million in 1963-64) for chemical warfare research (gas) and on discovering how to keep helicopters from being shot down by angry peasants. Its Senior Economists, with expertise in Newly

Developing Nations (the success of agriculture in India is perhaps partially their doing) have often been called on by such Government agencies as AID for advice and planning in all sorts of matters—military, economic, and social—concerning the Vietnamese people.

Of the Senior Economists perhaps the most notorious is Eugene Staley, architect of the Staley plan for "strategic hamlets," under which (or a reasonable facsimile thereof) 6,000 peasants were recently herded out of the Iron Triangle into what are essentially concentration camps. Staley, then Research Director of the "International Industrial Development Center" at SRI, spent three months in Vietnam, mostly in Saigon, and arrived, under the apparent influence of Diem's brother Ngo Dinh Nhu, as what Jean Lacouture calls "an entire war policy" of which part was the plan for the camps. Not surprisingly, they resembled the agrovilles the French had tried without success. Not surprisingly, they failed again. Not surprisingly, the plan is still being used.

Staley is presently a professor in Stanford's School of Education. Of course. And still a Senior Economist at SRI. Of course. Working in research on "Planning Operational Education and Training for Development" in Newly Developing Nations. Of course. But, more about SRI in another issue.

Three directors of SRI are also members of the board of Pacific Telephone and Telegraph, a subsidiary of AT&T (the nation's 7th leading war contractor last year), and another tenant of the Industrial Park. AT&T is currently setting up AUTOVON, a private(?) War Department worldwide telephone system, for about a tenth of which PT&T seems responsible.

Also on the board of PT&T is Charles Ducommun, Stanford Trustee and director of Lockheed Aircraft Corp., also a tenant of the Park.

Lockheed has for some years been number one merchant of death in the US—and that may go for the world, too. Mr. Ducommun produces the F-12, F104, P-3, SR-71 military aircraft, the C-130, C-141, and C-5A military transports, radar, gun-fire control systems, the Poseidon and Polaris missiles, and tactical missile systems. The F-104 is used as fighter support for bomb runs over North Vietnam and it packs Sidewinder missiles, whose manufacture is contributed to by two other tenants of the Park: General Precision and Eastman Kodak.

"Lockheed wings flashed across the Pacific in 1965 to fight and support the conflict in the Far East," says a company publication. "As they did in the Cuban crisis, battle-ready F-104 Starfighters...sped to the trouble zone....Eighteen C-130's paraded over 1,100 Vietnamese troops into a jungle hot spot. A KC-130...directed support strikes from 22,000 feet....Rushed to Da Nang from California, F-104C Starfighters helped establish U.S. air superiority over Vietnam. With skies cleared of opposition [sic], they struck at tree-top level."

Apparently, having established "air superiority," Lockheed plans to make the most of it with the "first rotor-craft designed exclusively as a weapons platform: the two man vehicle will carry machine guns, grenade launchers, rockets, and anti-tank missiles....We are

(Cont. p.C)

KANE TOTAL DEFENSE CONTRACTS	RANK	PROJECTS		
		MISSILES	AIRCRAFT	OTHER
Control Data Corporation Polaris \$41 million	9T	Polaris Polaris Saturn B Atlas, Skybolt Pershing, Talos Redwinder	F-111*, F-4C*, F-4D*, F-100*, F-104*, F-105*, F-106, RF-4C*, RD-121 A-7A*, C-131*, A-4B*, KC-135*, B-52*, B-70	Electronic Equipment (Classified)... Tactical Operations System
Eastman-Kodak	81st			Proximity Fuze Optical Bombing Systems Detection Devices Explosives Aerial Photography
General Precision \$117.4 Million	43	Polaris Saturn B Atlas, Skybolt Pershing, Talos Redwinder	F-111*, F-4C*, F-4D*, F-100*, F-104*, F-105*, F-106, RF-4C*, RD-121 A-7A*, C-131*, A-4B*, KC-135*, B-52*, B-70	Ordnance Devices
IBM	14.	Titan II & III	B-52*	Guidance Systems
SRI & SMC	26		Boeing 707, Mark II & Mark III Fighters	
UTI			F-111*, A-7A*, CR-47A*	Electronic Counter- Measures
\$207 million				
Kaiser Industries \$44.4 Million	13	Minuteman Polaris Pershing	F-111*, A-7A*	Rocket Nozzles Flite-Path Navigation Systems
*Specifically: Kaiser Aerospace & Electronics				
Lockheed Aircraft Corp.		Polaris Poseidon	F-111, F-102*, SR-71, F-3 C-131*, C-141*, C-1A	Vertical Missiles
Teleidyne		Mark, Talos Titan, Atlas Minuteman Pershing Polaris	F-4H*, F-4E, F-4G*, F-105, F-106, F-110 F-121*, C-130*, C-131 C-141*, A-3J, A-4C A-7A*, B-52*, B-58	CH-46*, CH-53 Bell Helicopters
S.R.T. will be covered in our next issue.				

NAME	TYPES OF WAR WORK	PROJECTS
Aerotherm	Aerothermodynamics Rocket Nozzle Linings	
Applied Technology	Electronic Countermeasures Reconnaissance & Surveillance Systems for Aircraft	F-9C*, F-100*, F-105*
Beckman Instruments	Chemical Personnel Detection	By Means of Gaseous & Particulate Materials; Development of Chemical Agent Detection Instrument
Computer Usage	Data Processing	Military R & D
Energy Systems	Electronics	Military R & D
Fairchild Camera & Instrument	Aircraft Camera, Precision Bomb Fuses Countermeasures	RF-4C*, RF-4D*
Granger Associates	Communications Equipment	B-111*, KC-135*
Hewlett-Packard	Electronic Measurement & Test Equipment	For Army, Navy and Air Force
Itek Corp.	Optics, Electronics Reconnaissance Photography Graphic Data Processing	Digital Mapping System For Production of Topographic Maps From Aerial Photographs
Malatek	Electronic Equipment Countermeasures	AN/FRT-17 Countermeasures Receiver System
Optics Technology	Optical Systems Radar and Warfare Systems	Feasibility Study of Ultra- Violet Absorption Using Photorefraction - U.S. Army, Ft. Detrick
Pacific Tel & Tel	Antennas - A Private Worldwide Telephone System for The Dept. of Defense	7 of 66 Switching Centers
Utah Construction & Mining	Construction	Grand Forks AFB Mainstrom AFB
Varien Associates	Electronics Automatic Anti-Personnel Mine Disposal System	Rocket Missiles; Mine-X Airlaunch & Ground- based Military Communication Systems in Vietnam
Watkins-Johnson Electronic Components	Traveling Wave Tubes Reconnaissance, Surveillance	

Weapons presently used in Vietnam
(Weapons being to be used in Vietnam)

(Cont. from p.B)

mounting an intensive effort to enlist
the Army as a customer for battlefield
direct fire missiles."

Lockheed Missiles and Space Corp.,
Stanford Industrial Park, does military
research and development, and secretaries
will tell you, if you ask, that they
presently have a team of researchers down
the road at Kaiser Aerospace and
Electronics, Stanford Industrial Park,
"working on a secret project."

Oddly enough, Edgar Kaiser, Pres-
ident and director of the Kaiser
conglomeration, and Harold Quinton, a
Kaiser director, are both members of
the Board of SRI. Kaiser has been an
SRI client.

Kaiser Aerospace and Electronics
boasts that "at its San Leandro plant
the company is a leader in the produc-
tion of nozzles for major military
missile programs" and that "the fully
integrated plant and experience in
manufacture of rocket nozzles places
the company in an excellent position
to participate in new missile pro-
grams."

In the Park, Kaiser produces the
"Flite-Path" navigation system for the
"Intruder," the Navy's A-6 "all-weather
strike aircraft." Grumman, who makes the
plane, calls it 'the hard core of the
Navy's attack forces,' and says that the
"heart of its night, all-weather capabili-
ty is its automatic radar detection and
navigation systems." The plane is used
extensively in the Navy's carrier-based
warfare in Vietnam; Kaiser's "Flite-
Path" production in the Park has more
than doubled since 1965.

The war takes a lot out of Kaiser:
16,000 trucks in 1965 alone, thousands
of aluminum airfield landing mat sets,
some IST's. Kaiser was thirteenth
largest war contractor in 1966.

A good number of the corporations
with operations in the Park produce
navigation systems, radar systems,
reconnaissance devices, and electronic
countermeasures for the military. IBM,
one of the directors of which, Paul
Davis, is (again) also a director of
SRI, has contracts to provide systems
for fighters built by North American and
Douglas, and it supplies systems for SAC
and for almost all other military
installations. It does a great deal of
research in radar, intelligence, data
demonstration devices, and data evalua-
tion. In 1966 it was the 34th largest
war contractor.

ITET, another tenant, in 1965 drew
16% of its business from "defense,"
providing such things as air traffic
control systems for carriers and naviga-
tional systems for the CH-46A Marine
helicopter. In the Park, Control Data
Corp. is "developing, designing,
fabricating, and casting... equipment
necessary to provide an experimental
automated tactical operations system"
under a \$4 million contract from the
Army. Itek Corp., satisfying "increas-
ingly rigorous government requirements
for sophisticated reconnaissance
systems" has developed, tested, and is
manufacturing mapping systems for the
Army. Itek, furthermore, develops
serial cameras for reconnaissance, as
does Fairchild Camera and Instrument (of
which Fairchild Semiconductor, in the
Park, is a division), while Eastman

(Cont. p.D, col. 1)

Kodak (also a Lenient) provides the film for reconnaissance flights. Both Eastman and Fairchild contract for explosives as well: Fairchild manufactures fuses for 2.75 inch rockets (to which IT&T also contributes) and other "ordnance items" for the Army, while Holston Defense Corp., a wholly owned subsidiary of Eastman, makes ammunition and "various explosives and propellants."

Beckman Instruments, a smaller corporation with operations in the Park, whose president, A.O. Beckman, is a director of SRI, has had a number of contracts in developing "chemical detection of personnel by means of gaseous and particulate materials," one of which was awarded by the Edgewood Arsenal, one of the two Army precursors of chemical and biological warfare research. Optics Technology, another small corporation and Park tenant, has held at least one contract in biological warfare systems with the Army Chemical Biological and Radiological Warfare Center, Ft. Detrick, Md.

Many of the firms in the Park, or their parent companies, contribute to the same military missiles. Lockheed makes the Polaris, Kaiser the major nozzle for it, Control Data the target computer system for the ship that launches it, and General Precision (whose Link Division is in the Park) also contributes. Kaiser, Varian, and General Precision contribute to the Pershing missile; Varian and Teledyne (which recently merged with Microwave Electronics Corp., a Park tenant) contribute to the Army Hawk; Teledyne, Control Data, and General Precision contribute to the Navy Talos.

In 1965, Teledyne was 68th largest War Department contractor, with about 75% of its contracts to the Department over the Department's contractors and a better than 25% sales increase, having profitably involved itself in the manufacture of patrol boats for the Navy, parts for 20mm cartridges for the Army, elements of attack helicopters for the Marines, "Merchiatrol" motors for use in F-104, F-105, F-106, B-52, B-58 aircraft, and so on, and so forth.

Before its merger with Teledyne, Microwave Electronics indicated that



Fred Terman
Vice President
and Provost
Emeritus

Resistance

capturing a part of the arms business was its purpose. In 1964, with a backlog of nearly \$3 million in unfilled contracts, the company announced in its annual report that "evolution of such newer weapons as the F-10X fighter and the VAI aircraft indicates a bright future for the continuing successful penetration of MEC [Microwave Electronics Corp.] into its established areas of contribution." Apparently it was so successful as to attract Teledyne's embrace.

Though his present position with the company is unclear, before the merger, William Rembo, Professor of Electrical

Engineering in Electrical Industrial Park with 3 others of the 80 strong University Board of Directors, he is still on it.

Applied Technology: Ronald Draper, Dept. of Electrical Engineering, Stanford University; R. L. Finney Carter, Pres., 1959-1965; Prof. H. Smith, Prof. of EE, Director, Stanford Electronics Laboratory; Donald W. Willard, Prof. of EE, Director, Stanford Radioscience Laboratory.

Belshaw Instruments: G.H. Rembo, SRI

Energy Systems: by Arthrop Public Service Co.; Robert Rembo, Pres.

Granger Associates: David Packard, PD, SRI; F.B. Isaacs, Vice Pres., & President; Allen P. Tolson, Prof. of EE, Ass't Director, Stanford Radioscience Lab; Radio Sciences Director, SRI.

Hewlett-Packard: K.A. Beale, SRI; J.P. Meek, SRI; George Packard, PD, SRI; R.W. Brown, SRI; Ernest Arnould, Dean, Stanford Business School, Chairman of the Board, SRI; R.E. Terman, VP & Project Director.

Kaiser Industries: Edger Terman, SRI

Lindbergh Aircraft: John Lindbergh, PD

Pacific Telephone & Telegraph: Charles Ducommun, SRI; Edward Carter, SRI; Christian de Saenger, SRI; Ernest Tolson, SRI

SRI: R.R. Doyle, H.K. Thompson, V. Packard, T.P. Pike, H.C. Symanski-Trutwin; J.C. Wallace Sculley, Pres., SRI; Ernest Arnould, Dean, Business School

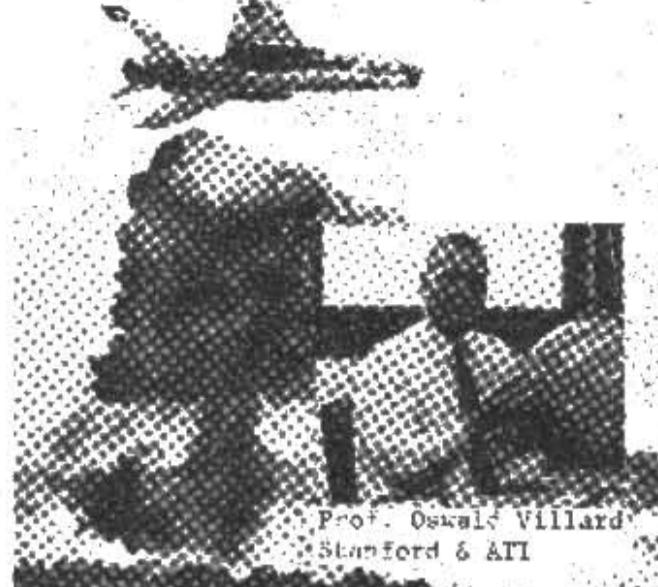
Teletac: Microwave Electronics Corp.; Prof. A. Terman, Prof. of EE, Chairman SRI/CSB/SRI; Farrell McGroarty, Senior Tech, Engineering School

U.S. Construction & Mining: Edward Packard, SRI; A.C. Grinde, VP, Director, Stanford Research Institute, CSB/SRI

Watkins-Johnson: W.H. Hewlett, SRI; Dean Kettner, SRI; Ernest Arnould, CSB, SRI

W. G. Clark's "Military-industrial complex" exists, "as in the American interests of business to concentrate on the free competitive market," Ernest Arnould, Stanford Daily, April 4, 1966.

Engineering at Stanford and Associate
Dean of the School of Engineering, sat on Microwave's board. With him, as consultant, was another Associate Dean of the Engineering School, Farrell McGroarty. Rambo is still a member of the board of another firm, Applied Technology, Inc., whose headquarters are in the Park, and whose business is "substantially all [with] the Government or other customers engaged in programs relating to national defense." "Most of the Company's products," says a January, 1967, prospectus, "are used to gather information concerning an adversary's electronic capabilities or to impair the operational effectiveness of certain enemy weapons. A major portion of ATI's business is classified." That the company is, in fact, concerned almost solely with weapons, is apparent from its contracts with the Air Force. They concern various aircraft: the F-100, F-4C, F-105, and B-52, all presently in constant use against Vietnam.



Prof. Oswald Villard
Stanford & ATI

Joining Rembo as directors of Applied Technology are four other men with Stanford connections of one sort or another: one is William Ayer, President of ATI, whose "previous experience includes an association of six years with the Stanford University applied electronics program sponsored by the armed services." John Grigsby, ATI's Vice President, was associated with the same program from 1952-59. E. Finney Carter, another director of ATI, was President and Director of SRI from 1959-63. Oswald Willard, the fourth, is the director of the Stanford Radioscience Laboratory and, with Rembo, a professor of Electrical Engineering.

Considering these things, it is not surprising that we should find that Rembo holds, as I understand, the only classified contract at Stanford awarded by the CIA and that he should be both director of Stanford's Electronics Laboratories and a member of its Research Steering Committee. Nor, further, should we be surprised that he is Chairman of the Faculty Committee on Land Development, which, I believe, is that committee which advises as to how Industrial Park land ought to be used. He is also a member of the Executive Committee of the Academic Council.

Rembo's Applied Technology contributes to the F-105's that bomb and strafe the South with ease and the North with some discomfit. Control Data and General Precision do too. Applied Technology contributes to the A-12's that never see their target. So do General Precision and IBM. General Precision contributes to the Boeing XQ-135 Stratotanker, the plane that refuels the F-105's en route to or from the North. As does Granger Associates.

And we are back where we began. With the Stanford Granger directors: David Packard, distinguished alumnus (or was it Hewlett), and Fred Terman, Vice President and Provost Emeritus. "We have been pioneers in creating a new type of community, a community of technical scholars...composed of industries utilizing highly sophisticated technologies, together with a strong university that is sensitive to the creative activities of the surrounding industry. This pattern appears to be the wave of the future."

Resist.

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